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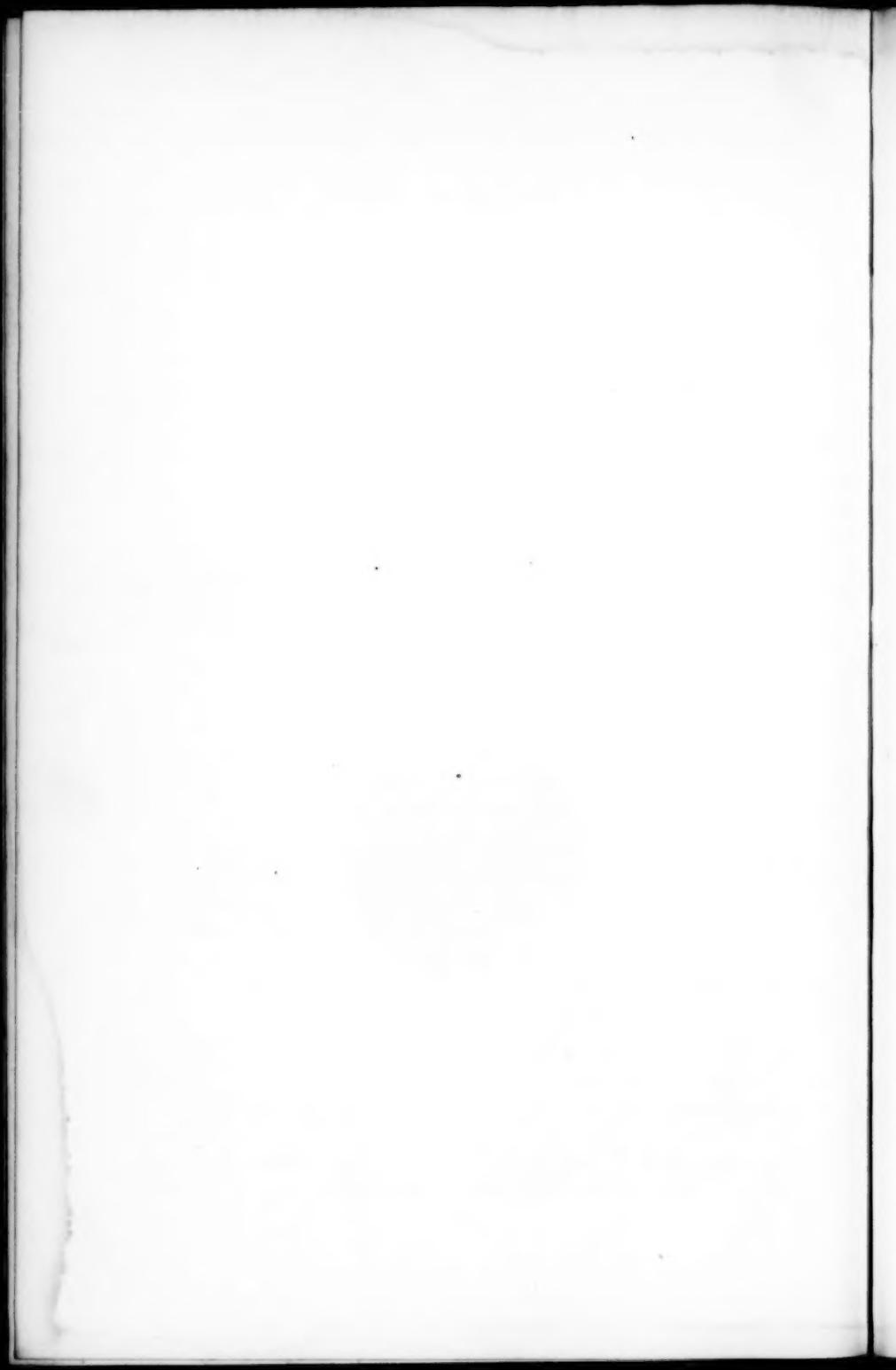


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MILITARY LAW.

BY GENERAL WILLIAM T. SHERMAN.

WASHINGTON, D. C.,

December 9, 1879.

GENERAL W. S. HANCOCK,

President of the Military Service Institution,

Governor's Island, N. Y. Harbor.

*My Dear General,—*I have examined somewhat critically the first number of the Journal of the "Service Institution" of which you are the President, and it affords me pleasure to convey to you my judgment, that this Journal, if published annually or oftener, may be made the vehicle of much valuable knowledge to the profession. The number before me in typography is excellent, and in the subjects discussed is most interesting and valuable. The opening, or inaugural address, by General Schofield is what we had a right to expect from him, and the remarks on the Articles of War and the Common Law Military, by Brevet Lieut.-Colonel G. Norman Lieber, should be read and studied by every officer of the army. I will advise this officer to further pursue the same line of study, and endeavor to influence others whose tastes lie in that direction, to draw from foreign sources, and from the experiences of American officers and authors, all that is possible on the following text which is extracted from the article of Colonel Lieber referred to :

"Military law is founded on the idea of a departure from "the civil law, and it seems to me a grave error to suffer "it to become a sacrifice to principles of civil jurisprudence "at variance with its object. A limit exists somewhere, a "limit within which it should be possible to say that mili-

"tary law has its common law, and is not controlled by "the common law of another system."

I agree with him perfectly and that it will be a grave error if, by negligence, we permit the military law to become emasculated by allowing lawyers to inject into it principles derived from their practice in the civil courts, which belong to a totally different system of jurisprudence.

The object of the civil law is to secure to every human being in a community all the liberty, security and happiness possible, consistent with the safety of all. The object of military law is to govern armies composed of strong men, so as to be capable of exercising the largest measure of force at the will of the nation.

These objects are as wide apart as the poles, and each requires its own separate system of laws—statute and common. "An army is a collection of armed men obliged to obey one man." Every enactment, every change of rule which impairs this principle weakens the army, impairs its value, and defeats the very object of its existence. All the traditions of civilian lawyers are antagonistic to this vital principle, and military men must meet them on the thresh-hold of discussion, else armies will become demoralized by engraving on our code their deductions from civil practice. The examples given by Colonel Lieber of the change of the old 27th article of war, to the new 24th; and of the old 65th to the new 104th, are directly to the point, and these changes almost defeat the ends of common justice and discipline.

In the army, we recognize the binding nature of all statutes, but claim that the oath administered to the members of *all* courts-martial, as prescribed in the 84th article of war, recognizes the existence of a common law for the army, as absolutely necessary to its existence as is universally accepted for the common law in civil practice.

"You, A. B., will well and truly, try and determine * * * according to evidence, the matter now before you, * * *

"according to the Rules and Articles for the government of
"the armies of the United States, * * and if any doubt
"should arise, not explained by said Articles then according
"to your conscience, the best of your understanding, and the
"custom of war in like cases."

Again the 62d article of war reads as follows: "All
"crimes not capital, and all disorders and neglects, which
"officers and soldiers may be guilty of, to the prejudice of
"good order and military discipline, though not mentioned
"in the foregoing articles of war are to be taken cogni-
"zance of by courts-martial, etc." * *

In no land on earth has any written code of laws been de-
vised to meet all the millions of shades and degrees of crimes
and disorders incident to human nature, and, therefore the
law-making power contents itself with defining those most
common and usual, and leaves the balance to be settled by
trial courts governed by usage, or by general principles.
This is the case with the military as it should be. Twelve
pages contain all the statutes of the United States for the
government of the armies of the United States in war, and
in peace. These are grouped into 128 articles, of which
forty-eight define the crimes, neglects and disorders to be
punished; fifty-nine describe the courts to try and punish
these, and all other possible offences, and the remaining
twenty-one announce general principles; and our experience
is that more than one-half the trials by courts-martial fall
under the 62nd article—"Conduct to the prejudice of good
"order and discipline."

It is greatly to be desired that the common law for the
armies of the United States should be compiled—not from
the doctrines and experience of civil lawyers, but from the
experience of the best ordered and best governed armies of
Europe and America. No nobler or better object can pre-
sent itself for the consideration of the Military Service In-
stitution of the United States, of which you are the Presi-
dent—and to this end I submit herewith two papers, which

are doubtless the parents of the mutiny act of England, and of the articles of war in our own country. These papers, though obsolete, explain the reasons for many of our modern customs and usages, and if published in your magazine will lead to other similar publications and finally result in an enlightened understanding of the principles which lead to excellence in the government of armies, which result in success.

Civilian lawyers are too apt to charge that army discipline is tyranny. We know better. The discipline of the best armies has been paternal, just and impartial. Every general, and every commanding officer knows, that to obtain from his command the largest measure of force, and the best results, he must possess the absolute confidence of his command by his fairness, his impartiality, his sense of justice and devotion to his country, not from fear. Yet in order to execute the orders of his superiors he must insist on the implicit obedience of all in his command. Without this quality no army can fulfil its office, and every good citizen is as much interested in maintaining this quality in the army, as any member of it.

Therefore I repeat that the time is opportune for all who seek to honor their profession, to study these subjects and help to establish the result that the "common law of the "army be *not* controlled by the common law of another "system," proceeding from an opposite principle.

I am, with respect, yours most truly,

W. T. SHERMAN, *General.*

The two papers referred to by General Sherman follow herewith: One an extract from the "Annals of Roger de Hoveden, A.D., 1190;" the other an extract from "the Animadversions of Warre, by Robert Ward, Gentleman and Commander."

ANNALS OF ROGER DE HOVEDEN, A.D. 1190. (Vol. ii., page 140.) *

(Extract.)

* * * * *

IN the meantime, the king of England marched into Gascony and laid siege to the castle of William de Chisi, and took it; on which he hanged William, the owner of the castle, because he had plundered pilgrims from Saint Jago,⁴⁷ and other persons, as they passed through his lands. After this, the king of England proceeded to Chinon, in Anjou, where he appointed Gerard, archbishop of Auxienne, Bernard, bishop of Bayonne, Robert de Sabul, Richard de Camville, and William de Fortz de Oleron, chiefs and constables of the whole of his fleet which was about to proceed to the land of Syria, and gave them ordinances to the following effect :⁴⁸

The Charter of Richard, King of England, containing ordinances for those who were about to proceed by sea.

"Richard, by the grace of God, King of England, Duke of Normandy and Aquitaine, and Earl of Anjou, to all his subjects about to proceed by sea to Jerusalem, greeting. Know ye, that we, with the common consent of fit and proper men, have made the enactments under-written. Whoever shall slay a man on ship-board, he shall be bound to the dead man and thrown into the sea. If he shall slay him on land, he shall be bound to the dead man and buried in the earth. If any one shall be convicted, by means of lawful witnesses, of having drawn out a knife with which to strike another, or shall strike another so as to draw blood, he shall lose his hand. If, also, he shall give a blow with his hand, without shedding blood, he shall be plunged in the sea three times. If any man shall utter

* The Annals of Roger de Hoveden, comprising The History of England and of other countries of Europe, from A.D. 732 to A.D. 1201. Translated from the Latin with notes and illustrations. By HENRY T. RILEY, Esq., B. A. Barrister-at-Law. In two volumes. Vol. II., A.D. 1181 to A.D. 1201. London : H. G. Bohn, York Street, Convent Garden. MDCCCLIII.

⁴⁷ Saint Jago de Compostella.

⁴⁸ These are a small portion of what are known as the "Oleron Laws," from having been made by King Richard when his fleet was lying at Oleron, an island at the mouth of the river Charente. They form the basis of a large part of the sea-laws in use at the present day.

disgraceful language or abuse, or shall curse his companion, he shall pay him an ounce of silver for every time he has so abused him. A robber who shall be convicted of theft shall have his head cropped after the manner of a champion,⁶⁰ and boiling pitch shall be poured thereon, and then the feathers of a cushion shall be shaken⁶¹ out upon him, so that he may be known, and at the first land at which the ships shall touch, he shall be set on shore. Witness myself, at Chinon.

The king also gave orders, in another writ of his that all his subjects who were about to proceed to sea should pay obedience to the orders and commands of the before named justices of his fleet. After this, the king proceeded to Tours, and there⁶² received the scrip and staff of his pilgrimage from the hands of William, archbishop of Tours; but it so happened that while the king was leaning on the staff, it broke asunder.

After this, the said king, and Philip, King of France, met at Vezelay, where rests the body of Saint Mary Magdalen. Here they stayed two days, and left the place on the octave of the Nativity of Saint John the Baptist. When they had arrived at the City of Lyons on the Rhone, after they with the greater part of their households had passed over the bridge across that river, the bridge, being thronged with men and women, broke down, not without doing injury to great numbers. Here also the two kings separated, in consequence of the multitude of men who followed them, as one place was not sufficient to hold them. Accordingly the King of France, with his troops, went on to Genoa, while the King of England proceeded with his to Marseilles.

* * * * *

⁶⁰ Champions, before commencing the combat, had the hair cut close, probably for the purpose of offering no unfair advantage to the antagonist, by reason of the length of the hair and the facilities thereby offered for pulling them to the ground.

⁶¹ This is a very early instance of the practice of tarring and feathering.

⁶² Roger of Wendover says that he received it at Vezelay.

ARTICLES AND MILITARY LAWES TO BE
OBSERVED IN THE WARRES.*

SECT. XVIII. CHAP. VII.

*Divers articles and Martiall Lawes, whereby an Army is to bee regulated
and governed both in Camp and Garrison.*

By these Lawes the King of Sweden governed his Army.

In primis. No Commander nor private Souldier whatsoever, shall use any kind of Idolatry, Witchcraft, or Inchanting of Armes, whereby God is dishonored, upon pain of death.

2. If any shall blaspheme the name of God, either drunk or sober, the thing being proved by two or three witnesses, he shall suffer death without mercy.

3. If any shall seem to deride or scorne God's Word or Sacraments, and bee taken in the fact, hee shall forthwith bee convented before the Commissioners Ecclesiasticall, to be examined, and being found guilty, he shall be condemned by the Court of Warre to lose his head: but if they were spoken through haste or unadvisedly, for the first offence hee shall bee in yrons fourteen dayes, and for the second, be shot to death.

4. If any shall swear in his anger by the name of God, being convicted, shall pay halfe a moneth's pay unto the poor: Or if any bee found drinking, or at any other evill exercise, he shall forfeit half a moneth's pay, and at the next assembly of prayer or preaching, he shall be brought upon his knees before the whole assembly, and there crave pardon of Almighty God.

5. To the end that God's Word be by no means neglected, Our will is, that publike prayers bee said every morning and evening throughout the whole Camp, at one time, in every several Regiment, they being called thereunto by the sound of the General's or Marshal's Trumpets, and the Drums of every private Company and Regiment.

6. Whatsoever Minister shall neglect his time of prayer, except a lawfull occasion hinders him, he shall for every time being absent, pay half a moneth's pay.

7. Whatsoever Souldier shall neglect the time of prayer, and is thereof advised by his Captain, he shall lie in prison 24 hours, except a lawfull occasion hindered.

8. If any Minister be found drunk or drinking at such time as he should preach, or read prayer, for the first offence he shall be gravely

* Animadversions of Warre. The Second Booke. By Robert Ward, Gentleman and Commander. London: Printed by John Dawson, 1639.

admonisht by the Commissioners Ecclesiasticall, and for the second fault be banisht the Leaguer.

9. Every Holy-day and every Sabbath-day at least, shall bee kept solemn with preaching in a place convenient, before and after noon; this also to bee done twice every week, if the time will permit; if there be any holy-daiies to come in the following week, the Minister shall after such Sermons or Prayers publikely bid them: who so shall neglect the time appointed (unlesse he have some lawfull let or occasion) shall be punished as aforesaid.

10. All Merchants and sellers of commodities whatsoever, so soon as they hear the Token or call to bee given, shall immediately shut up their doors, and so keep them during the said time of Prayer and Sermon; they that presume in that season to sell any thing, shall make forfeit of all things so sold, whereof the one half to goe to the Generall, and the other halfe to the next Hospitall; over and above which, the offender shall for one whole day be put in prison.

11. All drinkings and feastings shall in the time of Prayer bee given over, upon pain of punishment, as is before mentioned in the seventh Article; if any Souldier herein offends, he shall forfeit half his week's pay to the poor; and if he be an Officer, hee shall forfeit what shall be awarded.

12. For the explaining of this Article formerly exprest: If there bee none to complaine of these abuses, then shall the Minister himself give notice thereof unto the Colonell or Captain, and if he shall suffer such abuses to goe unpunished, then shall he give the Generall notice thereof, who shall doe him right.

13. All Priests and Ministers that are to be in our Camp or Leaguer, shall be appointed by the Bishop of the same Diocesse or Land from whence the Souldiers come whom he is to be among: no Colonell nor Captain shall take what Minister he shall think good, but shall be content with whom the Bishop shall appoint him.

14. To the intent that all Church businesse, as well in the field as otherwhere, may have an orderly proceeding; We ordain, That there be one Ecclesiasticall Consistory or Commission in our Leaguer, the President or chiefe person whereof shall bee Our own Minister, when We ourselves are personally present in the field. In Our absence shall the chiefe Minister to the Generall be the man; his fellow-Commissioners or ordinary Assessors shall be the chiefe Ministers to every Regiment of Horse and Foot; unto whom We give full power and authority to be Judges in all Church affaires, according to the Law of God and holy Church; what shall be by them decreed, shall be of as great force and strength, as if it were determined in any other Consistory whatsoever.

15. No Captain shall have liberty to take any Minister without the

consent of his Colonell, and of the Consistory. Neither again shall he discharge any, but by permission of the Consistory, he having there first shewed that Minister not to be worthie of his Charge.

16. If any Minister be found ill inclined to drunkenness or otherwise; then may his Colonell or Captain of Horse or Foot complain of him in the Consistory; and if his fellow-Ministers find him guilty, then may they discharge him of his place. In such complaints, shall the whole Consistory and the President severely also reprehend him, that others of the same calling may take example thereby, and be warned of such grosse errors, and give good example unto others.

17. For that no government can stand firmly, unlesse it be first rightly grounded; and that the Lawes be rightly observed; We, the King of, &c., doe hereby make known unto all our Souldiers and Subjects, as well Nobles as others; that in our presence they presume not to doe any unseemly thing: but that every one give us our due honour, as we ought to receive; who presumes to doe the contrary, shall bee punished at our pleasure.

18. Next shall our Officers and Souldiers be obedient unto our Generall and Field-Marshal, with other our Officers next under them, in whatsoever they shall command belonging unto our service, upon paine of punishment as followeth.

19. Whosoever behaves not himself obediently unto our great Generall, or our Ambassador coming in our absence, as well as if we ourselves were there in person present, shall be kept in irons or in prison, untill such time as he shall be brought to his answer, before a Councell of Warre, where being found guilty, whether it were wilfully done or not, he shall stand to the order of the Court, to lay what punishment upon him they shall thinke convenient, according as the person and fact is.

20. And if any shall offer to discredit these great Officers by word of mouth or otherwise, and not be able by proof to make it good, hee shall be put to death without mercy.

21. Whosoever offers to lift up any manner of Armes against them, whether hee doth them hurt or not, shall be punished by death.

22. If any offers to strike them with his hand, whether hee hit or misse, he shall lose his right hand.

23. If it falls out that our great Generall in any feast, drinking, or otherwise, doth offer injury to any Knight, Gentleman or other, which stands not with their honour to put up; then may they complain to the Commissioners for the Councell of Warre, where hee shall answer them, and bee censured by them according to the quality and importance of the fact.

24. As it is herespoken of our Generall; so also it is of all other our great Officers, as Field-Martiall, Generall of the Orduance, Generall of

the Horse, Serjeant-Major Generall, Quarter-Master Generall, and Muster-Master; all which, if they commit any such offence through envie or other by-respect, they shall answer it before the Court of Warre, as is before mentioned.

25. As every Officer and Souldier ought to be obedient unto our Generall and other great Officers; so shall they in the under Regiments be unto their Colonell, Lieutenant-Colonell, Serjeant-Major, and Quarter-Master, upon paine of the same punishment before mentioned.

26. If any Souldier or Officer serving on horse-back or foot, shall offer any wrong or abuse unto his superior Officer either by word or deed, or shall refuse any duty commanded him, tending unto our service, he shall be punisht according to the importance of the fact.

27. If any Colonell, Lieutenant-Colonell, Serjeant-Major, or Quarter-Master, shall command any thing not belonging unto our service, he shall answer to the complaint before the Court.

28. In like manner if any inferiour Officer either of horse or foote does challenge any common Souldier to be guilty of any dishonest action; the Souldier finding himself guiltless, may lawfully call the said Officer to make proofe of his words before the Court as his equall.

29. If any Souldier either of horse or foote shall offer to strike his Officer that shall command him any duty for our service, he shall first lose his hand, and be then turned out of the Quarter. And if it be done in any Fort or place beleagured after the watch is set, he shall lose his life for it.

30. And if he doth hurt to any of them, whether it be in the field or not, he shall be shot to death.

31. If any such thing falls out within the compasse of the Leaguer or the place of Garrison, in any of the Souldiers' lodgings where many of them meeet together, the matter shall be inquired into by the Officers of the Regiment, that the beginner of the fray may be punished according to desert.

32. He who in the presence of our Generall shall draw his sword, with purpose to doe mischiefe with it, shall lose his hand for it.

33. He who shall in anger draw his sword while his Colours are flying, either in Battell or upon the March, shall be shot to death; if it be done in any strength or fortified place, he shall lose his hand, and be turned out of the Quarter.

34. He who shall presume to draw his sword upon the place where any Court of Justice is holden, while it is holden, shall lose his life for it.

35. He that drawes his sword in any strength or Fort to doe mischiefe therewith, after the watch is set, shall lose his life for it.

36. No man shall hinder the Provost Marshal Generall, his Lieutenant

or servants, when they are to execute any thing that is for our service; who does the contrary, shall lose his life.

37. Leave is given unto the Provost Marshall Generall to apprehend all whatsoever that offends against these our Articles of Warre. All other offenders he may likewise apprehend by his owne authority.

38. If the Provost Marshall Generall shall apprehend any man by his owne authority; he may keepe him either in prison or in irons, but by no means doe execution upon him after the Court of Warre is ended, without first giving the Generall notice thereof.

39. The Provost Marshals of every Regiment, have also the same priviledge under their owne Regiment and Company, that the Provost Marshall Generall hath in the Leaguer.

40. Every Serjeant-Major commanding in the whole Leaguer what appertaines to his Office, shall be obeyed by every man with his best endeavour.

41. Whatsoever is to be published or generally made knowne shall be proclaimed by sound of Drumme and Trumpet, that no man may pretend ignorance in it; they who after that shall be found disobedient, shall be punished according to the quality of the fact.

42. No Souldier shall thinke himselfe to good to work upon any peece of Fortification, or other place where they shall be commanded for our service upon paine of punishment.

43. Whosoever shall do his Majesties businesse slightly or lazily, shall first ride the wooden horse, and lie in prison after that, with bread and water, according as the fact shall bee adjudged more or lesse hainous.

44. All Officers shall diligently see that the Souldiers plye their worke, when they are commanded so to doe; he that neglects his duty therein shall be punished according to the discretion of the Court.

45. All Souldiers ought diligently to honour and obey their Officers, and especially being by them commanded upon service; but if at any time they can on the contrary discover that they are commanded upon a service which is to our prejudice any manner of way; then shall that souldier not obey him what charge soever he receives from him, but is presently to give notice of it.

46. No Colonell nor Captaine shall command his souldiers to doe any unlawfull thing; which who so does, shall be punished according to the discretion of the Judges. Also if any Colonell or Captaine or other Officer whatsoever, shall by rigour take any thing away from any common souldier, he shall answer for it before the Court.

47. No man shall goe any other way in any Leaguer wheresoever, but the same common way laid out for every man, upon paine of punishment.

48. No man shall presume to make any Alarne in the quarter, or to shoot off his Musket in the night time, upon paine of death.

49. He that, when warning is given for the setting of the watch by sound of Drumme, Fife, or Trumpet, shall wilfully absent himself without some lawfull excuse; shall be punishit with the wooden horse, and be put to bread and water, or other penance, as the matter is of importance.

50. He that is taken a sleepe upon the watch, either in any strength, trench, or the like, shall be shot to death.

51. He that comes off his watch where he is commanded to keepe his Guard, or drinke himselfe drunke upon his watch or place of Sentinel, shall be shot to death.

52. He that at the sound of Drumme or Trumpet repaires not to his Colours, shall be clapt in irons.

53. When any march is to be made, every man that is sworn shall follow his Colours; who ever presumes, without leave, to stay behind shall be punished.

54. And if it be upon mutiny that they doe it, be they many or be they few, they shall die for it.

55. Who ever runnes from his Colours, be he Native or Forreiner, and does not defend them to the uttermost of his power so long as they be in danger, shall suffer death for it.

56. He that runnes from his Colours in the field shall dye for it; and if any of his Comrades kill him in the meane time he shall be free.

57. Every man is to keep his own ranck and file upon the march, and not to put others from their orders; nor shall any man cast himselfe behind, or set himselfe upon any waggon, or horse-back; the offenders to be punished according to the time and place.

58. Whatever Regiment shall first charge the enemy and retire afterwards from them before they come to dint of sword with them, shall answer it before our highest Marshal's Court.

59. And if the thing be occasioned by any Officer, he shall be publicly disgraced for it, and then turned out of the Leaguer.

60. But if both Officers and Souldiers bee found faulty alike, then shall the Officers be punished as aforesaid. If it bee in the Souldiers alone, then shall every tenth man be hanged; the rest shall bee condemned to carry all the filth out of the Leaguer, untill such time as they performe some exploit that is worthy to procure their pardon, after which time they shall bee clear of their former disgrace. But if, at the first, any man can by the testimony of ten men prove himselfe not guilty of the cowardize, he shall goe free.

61. When any occasion of service is, hee that first runs away, if any man kill him, hee shall bee free; and if at that time he escape, and be apprehended afterwards, he shall be proclaimed Traitor, and then put out

of the Quarter; after which, whosoever killeth him, shall never be called to account for it.

62. If any occasion be to enter any Castle, Towne or Sconce by assault or breach, he who retires from the place before hee hath been at handy blowes with the enemy, and hath used his sword, so far as it is possible for him to doe service with it, and before he bee by main strength beaten from it by the enemy, shall be punished as the Court shall censure him.

63. Whatsoever Ensigne-bearer shall flye out of any place of Battery, Sconce or Redout, before hee hath endured three assaults, and receive no relieve, shall be punished as before.

64. Whatsoever Regiment, Troop or Company refuseth to advance forwards to charge the enemy, but out of fear and cowardize stayes behind their fellowes, shall be punished as before.

65. Whatsoever Regiment, Troop or Company is the beginner of any mutiny, shall be punished as is before mentioned; the first authour to die for it, and the next conserter to bee punished according to the discretion of the Court.

66. If any Regiment, Troop or Company shall flye out of the Field or Battell, then shall they three several times (six weeks being betwixt every time) answer for it before the Court, and if there it can be proved that they have done ill, and have broken their Oath, they shall be proclaimed Traitors, and all their goods shall bee confiscated, whether they bee present to answer it before the Court or not: if they bee absent, they shall bee allotted so many daies as wee shall appoint them for liberty to come in to answer it before the Court, where, if they clear themselves, well and good; if not, they shall have so many daies to retire themselves after which, if they be apprehended, then shall they be punisht according as the Court shall doom them.

67. Whatsoever Regiment, Troop or Company shall treat with the enemy, or enter into any conditions with them whatsoever (without our leave, or our General's, or chief Commander in his absence), whatsoever officer shall doe the same, shall be put to death for it, and all his goods shall bee confiscated; of the soldiery every tenth man shall be hanged, and the rest punished, as aforesaid.

68. Whosoever presuming to do the same, and shall be taken therewith, shall bee proceeded withall like those that flye out of the field; their goods also shall be confiscate.

69. If any that then were in company with such, can free themselves from being partakers in the crime, and can prove that they did their best to resist it, then shall they be rewarded by us according as the matter is of importance.

70. Whoever, upon any strength, holds discourse with the enemy,

more or lesse, without our leave, our Generals, or the Governour of the place; shall die for it.

71. If it bee proved that they have given the enemy any private intelligence, by letter or otherwise, without our leave as aforesaid; shall die for it.

72. They that give over any strength unto the enemy, unlesse it be for extremity of hunger or want of Ammunition; the Governour, with all the Officers, shall die for it; all the souldiers shall be lodged without the quarters without any Colours, they shall be made to carry out all the filth of the Leaguer; thus to continue untill some noble exploit of them be performed, which shall promerit pardon for their former cowardize.

73. Whatsoever souldiers shall compell any Governour to give up any Strength, shall lose their life for it: those, either Officers or Souldiers, that consent unto it, to be thus punished; the Officers to die all, and the Souldiers every tenth man to be hanged: but herein their estate shall be considered, if they already have suffered famine and want of necessaries for their life, and bee withall out of hope to bee relieved, and are so pressed by the enemy, that of necessity they must within a short time give up the Peece, endangering their lives thereby, without all hope of relieve: herein shall our General, with his Councell of Warre, either clear them, or condemne them according to their merit.

74. If any number of Souldiers shall, without leave of their Captain, assemble together for the making of any convention, or taking of any councell amongst themselves; so many inferiour Officers as bee in company with them shall suffer death for it, and the souldiers be so punished as they that give up any Strength. Also at no time shall they have liberty to hold any meeting amongst themselves, neither shall any Captain permit it unto them; he that presumeth to suffer them shall answer it before our highest Court.

75. If any being brought in question amongst others, shall call for help of his own Nation or of others, with intention rather to bee revenged than to defend himself; he shall suffer death for it, and they that come in to help him shall bee punished like Mutiners.

76. Whosoever giveth advice unto the enemy any manner of way, shall die for it.

77. And so shall they that give any token signe or Item unto the enemy.

78. Every man shall be contented with that Quarter that shall be given him either in the Town or Leaguer; the contrary doer to be accounted a Mutiner.

79. Whoever flings away his Armes, either in field or otherwhere, shall be scourged through the Quarter, and then be lodged without it, be inforc'd to make the streets clean untill they redeem themselves by some worthy exploit doing.

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80. He that selleth or pawneth his armes or any kind of ammunition whatsoever, or any Hatchets, Spades, Shovels, Pickaxes, or other the like necessary instruments used in the field, shall be, for the first and second time, beaten through the Quarters, and for the third time, punish'd as for other theft: hee also that buieth or taketh them upon pawn, be he souldier or be he victualler, he shall first lose his money, and then bee punished like him that sold them.

81. He that wilfully breaketh any of his Armes or Implements aforesaid, shall again pay for the mending of them, and after that be punish'd with bread and water, or otherwise, according to the discretion of the Court.

82. Hee that, after warning to the contrary, shall either buy or sell, shall first lose all the things so sold or bought, and then be punished for his disobedience, as is aforesaid.

83. No man that once hath been proclaimed Traitor, either at home or in the field, or that hath been under the hangman's hands, shall ever bee endured again in any Company.

84. No Duell or Combat shall bee permitted to bee fought either in the Leaguer or place of Strength: if any offereth to wrong others, it shall bee decided by the Officers of the Regiment; he that challengeth the field of another shall answer it before the Marshal's Court. If any Captain, Lieutenant, Ancient, or other inferiour officer, shall either give leave or permission unto any under their command, to enter combat, and doth not rather hinder them, shall be presently cashiered from their charges, and serve afterwards as a Reformado or common souldier; but if any harm be done, he shal answer it as deeply as he that did it.

85. Hee that forceth any woman to abuse her, and the matter bee proved, hee shall die for it.

86. No Whore shall be suffered in the Leaguer; but if any will have his own wife with him, he may; if any unmarried woman bee found, hee that keeps her may have leave lawfully to marry her, or else be forced to put her away.

87. No man shall presume to set fire on any Town or Village in our Land: if any doe, he shall bee punished according to the importancy of the matter, so as the Judges shall sentence him.

88. No Souldier shall set fire upon any Town or Village in the enemies' Land, without he be commanded by his Captain: neither shall any Captain give any such command unlesse hee hath first received it from us or our Generall: who so doth the contrary, he shall answer it in the Generals Councell of Warre according to the importance of the matter; and if it be proved to bee prejudiciale unto us, and advantagious for the enemy, he shall suffer death for it.

89. No Souldier shall pillage anything from our subjects upon

any March, Strength, Leaguer, or otherwise howsoever, upon pain of death.

90. He that beats his Host or his household servants, the first and second time hee shall be put in yrons, and made to fast with bread and water according as the wrong is that he hath done, if the harme be great, hee shall be punish'd thereafter, according to the discretion of the death.

91. None shall presume to do wrong to any that brings necessaries to our Leaguer, Castle or Strength whatsoever, or to cast their goods down off their Horses, and take away their Horses perforce; which whoso doth shall die for it.

92. They that pillage or steal either in our Land or in the enemies', or from any of them that come to furnish our Leaguer or Strength, without leave, shall bee punish'd as for other theft.

93. If it so please God that we beat the enemy, either in the field or in his Leaguer, then shall every man that is appointed follow the chase of the enemy, and no man give himselfe to fall upon pillage, so long as it is possible to follow the enemy, and untill such time as he be assuredly beaten; which done, then may their quarters be fallen upon, every man taking what he findeth in his owne quarters; neither shall any man fall to plunder one in another's quarters, but rest himselfe contented with that which is assigned him.

94. If any man give himselfe to fall upon the pillage before leave be given him so to doe, then may any of his officers kill him. Moreover, if any misfortune ensue upon their greedinesse after the spoyle, then shall all of them suffer death for it; and, notwithstanding there comes no dammage thereupon, yet shall they lye in Irons for one moneth, living all that while upon bread and water, giving all the pillage so gotten unto the next Hospitall. He that plunders another quarter, shall also have the same punishment.

95. When any Fort or place of Strength is taken in, no man shall fall upon the spoyle before that all the places in which the enemy is lodged be also taken in, and that the Souldiers and Burgers have layed downe their Armes, and that the quarters be dealt out and asssigned to every body; who so does the contrary, shall be punished as before.

96. No man shall presume to pillage any Church or Hospitall, although the Strength be taken by assault; except he be first commanded, or that the Souldiers and Burgers be fled thereinto and doe harme from thence; who dares the contrary, shall be punished as aforesaid.

97. No man shall set fire upon any Hospitall, Churche, Schoole, or Mill, or spoyle them any way, except he be commanded; neither shall any tyrannize over any Churchman, or aged people, men or women, maides or children, unlesse they first take armes against them, under paine of punishment at the discretion of the Judges.

98. No souldier shall abuse any Churches, Colledges, Schooles or Hospitalls; or offer any kind of violence to Ecclesiasticall persons, nor in any way be troublesome with pitching or in quartering upon them, or with exacting of contribution from them: no souldier shall give disturbance or offence to any person exercising his sacred function or Ministery, upon paine of death.

99. Let the billet and lodgings in every City be assigned to the Souldiers, by the Burge-masters or chiefe Head-borroughes; and let no Commander presume to meddle with that office; no Commander or common souldier shall either exact or receive of the Townesmen or Citizens anything, besides what the King or his Generall in his absence hath appointed to be received.

100. No Citizen nor Countryman shall be bound to allow unto either Souldier or Officer any thing but what is contained in the King's Orders, for contributions and enquarterings; (*viz.*) nothing besides house-roome, fire-wood, candle, vineger and salt, which is yet to be understood that the inferiour Officers, as Serjeants and Corporalls, and those under them, as also all common Souldiers, shall make shift with the common fire and candle of the house where they lie, and do their businesse by them.

101. If so be that Colonels and other Commanders have any servants or attendants, they shall not be maintained by the Citizens or yeomanry, but by their own Masters.

102. No Commander shall take any house or lodging in his protection, or at his owne pleasure give a ticket of freedome, when such tickets are not expressly desired of him, nor shall he receive any bribe or present to mend his owne commons withall, under any colour or pretext whatsoever. If any man desire a personall safeguard, let him be contented with that which is appointed in the King's Orders.

103. To Commanders and Souldiers present, let the usuall allowance be offered by the Citizens, but let no care be taken for such as are away.

104. New-levied Souldiers are to have no allowance before they be entertained at the Muster.

105. Nothing is to be allowed the Souldiers in any house but in the same where he is billitted; if they take any thing other where by force, they are to make it good.

106. If either Officer, Souldier, or Sutler be to travell through any Country, the people are not to furnish them with Waggons, Post-horse, or victuals but for their ready money, unlesse they bring a Warrant either from the King or the Generall.

107. No Souldier is to forsake his Colours, and to put himself under the entertainment of any other Colonell or Garrison, or to ramble about the Country, without he hath his Colonel's Passe, or his that is in his

stead: who so doth, it shall bee lawfull for any man to apprehend him, and send him prisoner to the next Garrison of the King's, where he shall be examined, and punished accordingly.

108. Whosoever have any lawfull Passes, ought by no means to abuse the benefit of them, or practise any cheats under the pretence of them. If any be found with any pilfery, or to have taken any man's cattell or goods; it shall be lawfull for the Countrey-people to lay hands upon them, and to bring them to the next Garrison; speciall care being had, that if the prisoner hath any letters of moment about him, they be speedily and safely delivered.

109. Our Carriers or Posts, though they have lawfull Passes to travell withall, yet shall they not ride their Post-horses, which they hire, beyond the next Stage. And if they shall take away any horse from one or other, to tire out with hard riding, and beyond reason; they shall be bound to return the horse again, or to make satisfaction for him. The same order shall take place, too, when any Regiment or Troop of our's shall remove from one Quarter to another; namely, when they shall hire Postillions or baggage-Waggons for the carriage of their Valises, Armes or Ammunition.

110. The houses of the Princes or Nobility which have no need to borrow our Guard to defend them from our enemy, shall not be pressed with souldiers.

111. Moreover, under a great penaltie, it is provided, that neither Officers nor Soulđiers shall make stay of, or arrest the Prince's Commissaries or Officers, or any Gentleman, Councillors of State, Senators or Burgers of any Cities, or other countrey-people; nor by any fact of violence shall offend them.

112. Travellers, or other passengers going about their businesse into any Garrisons or places of Muster, shall by no means bee stayed, injured, or have contribution laid upon them.

113. Our Commanders shall defend the countrey-people and Ploughmen that follow their husbandry, and shall suffer none to hinder them in it.

114. No Commander or common soulđier whatsoever, either in Towne or Garrison, or place of Muster, shall exact anything upon Passengers, nor shall lay any Custome or Toll upon any Merchandise imported or exported; nor shall any bee a hindrance to the Lord of the place, in receiving his due Customes or Toll-gathering; but to further them.

115. If any of our Officers having power of Command, shall give the Word for any Remove or March to some other Quarter; those soulđiers either of Horse or Foot that privily lurk behind their fellows shall have no power to exact part of the contributions formerly allotted for their maintenance in that place; but shall severally be punished rather for their lingring behind the Army.

116. Whatsoever is not contained in these Articles, and is repugnant to Military Discipline, or whereby the miserable and innocent country may against all right and reason be burdened withall, whatsoever offence finally shall be committed against these orders, that shall the severall Commanders make good, or see severally punished, unlesse themselves will stand bound to give further satisfaction for it.

117. According to these Articles, let every man governe his businesse and actions, and learne by them to take heed in coming into lurch or danger.

118. If any Souldier happens to get free-booty in any Castle, City, Towne, Fort Strength, or Leaguer ; and moreover whatsoever Ordnance, Munition for Warre, and victual is found there, shall be left for our use, the rest shall be the Souldiers, only the tenth part thereof shall they give to the sicke and maimed Souldiers in the Hospitalls. All prisoners shall first be presented to us, amongst which if there bee any man of note, whom we desire to have unto our selves, wee promise in lieu thereof honestly to recompence the taker of him, according to the quality of the person ; other prisoners of inferiour ranke may the takers keep unto themselves, whom by our leave or our Generalls they may put to their ransome and take it to themselves, but without leave they may not ransome them upon paine of death.

119. If any bee found drunken in the enemies Leaguer Castle, or Towne, before the enemy hath yielded himself wholly up to our mercy, and laid down his Armes; whosoever shall kill the said drunken Souldier, shall be free for it ; alwayes provided that good proofe be brought that hee was drunken ; and if that Souldier escape for that time with his life, and that it can appeare that some dammage or hindrance hath come into our service by his drunkenesse, then wheresoever he be apprehended he shall die for it ; but if no hurt ensued thereof, yet shall he be put in irons for the space of one month, living upon his pittance of Bread and Water.

120. All our Souldiers shall duely repaire unto the generall musters upon the day and houre appointed ; nor shall any Colonell or Captaine either of Horse or Foot, keepe backe his Souldiers from being mustered at the time when our Muster-masters shall desire to view them ; if any refuse, he shall be taken for a Mutineer.

121. No Colonell nor Captaine shall lend any of their Souldiers to another upon the Muster-dayes for the making up of their numbers compleat ; he that thus makes a false Muster, shall answer it at the Marshalls Court, where being found guilty he shall be proclaimed Traitor ; after which being put out of the Quarter, his Colours shall flie no more.

122. If any Souldier hires out himselfe for money to runne the*

* Running the Gate-lope or Purgatory, is, when he that hath done the fault, is to run between the Regiment standing halfe on one side, and halfe on the other, with whips or bastinadoes in their hands, to lash and cudgel the offender, which punishment many a shameless souldier will be hired to undergo for drinke or money.

Gate-lope three severall times, he shall be beheaded, and if any Captaine shall so permit or counsell his Souldier to doe the same, he shall be actually cashiered.

123. If any Horseman borrowes either Horse, Armour, Pistols, Saddle, Sword, or Harnesse to passe Muster withall, so much as is borrowed shall be escheated, and himselfe after that turned out of the Leaguer, as likewise he shall that lent it him; the one halfe of the Armes forfeited shall goe to the Captaine, and the other halfe unto the Parforce.

124. If it can be proven that any Horseman hath wilfully spoyled his Horse; hee shall bee made Traitor, lose his Horse and bee turned out the Quarter.

125. All Souldiers both of Horse and Foot shall be taken on at a free Muster, but not by any private Captaine; neither shall their pay goe on before they be mustered by our Muster-masters.

126. No Souldier either of Horse or Foot shall be cashiered by his Colonell, Captaine, or other inferiour officer; nor shall they who being taken on at a free Muster, have their men sworne to serve (if it please God) untill the next Muster, except it be upon a free Muster, at which time the Muster-masters, and his Colonell may freely give him his Passe.

127. If any forreine Souldiere shall desire his passe in any Towne or Garrison after the enemy be retired he may have it; but by no means whilst there is any service to be done against the enemy.

128. If any Souldier or Native subject, desires to bee discharged from the warres, he shall give notice thereof unto the Muster-masters; who if they finde him to bee sicke, or maimed, or that hee served twenty yeare in our warres, or hath beene ten severall times before the enemy, and can bring good witnesse thereof, he shall be discharged.

129. If any Colonell or Captaine, either of Horse or Foot does give any Passe otherwise than is before mentioned, he shall be punished as for other Fellonies; and he who hath obtained the same Passe, shall lose three moneths pay, and be put in prison for one moneth, upon bread and water.

130. No Colonell or Captaine either of Horse or Foot shall give leave to his Souldiers to goe home out of the Field, without leave of our Generall, or chiefe Commander; whosoever does the contrary, shall lose three moneths pay, and be put in prison for one moneth, upon Bread and Water.

131. No Captaine either of Horse or Foote shall presume to goe out of any Leaguer or place of Strength to demand his pay, without leave of the Generall or Governoour; who so doth, shall be cashiered from his place, and put out of the quarters.

132. No Captaine either of Horse or Foot shall hold backe any of

his souldiers meanes from him ; of which if any complaine, the Captaine shall answer it before the Court, where being found guilty, he shall be punisht as for other Felony ; also if any mischance ensue thereupon, as that the Souldiers mutine, be sicke, or endure hunger, or give up any Strength ; then shall he answer for all those inconveniences, that here-upon can or may ensue.

133. If any Captaine lends money unto his souldiers which he desires should be paid againe ; that must be done in the presence of the Muster-masters, that our service be no way hindered or neglected.

134. If upon necessity the case sometimes so falls out in the Leaguer, that pay bee not always made at the due time mentioned in the Commissions, yet shall every man in the meane time be willing to further our service, seeing they have victuals sufficient for the present, and that they shall so soone as may bee receive the rest of their means, as is mentioned in their Commission.

135. Very requisite it is, that good justice be holden amongst our Souldiers, as well as amongst other our Subjects.

136. For the same reason was a King ordained by God to be the Soveraigne Judge in the field as well as at home.

137. Now therefore in respect of many occasions which may fall out, his single judgment alone may bee too weak to discerne every particular circumstance ; therefore it is requisite that in the Leaguer, as well as otherwhere, there be some Court of Justice erected for the deciding of all controversies ; and to be carefull in like manner, that our Articles of warre be of all persons observed and obeyed so farre forth as is possible.

138. We ordained therefore that there be two Courts in our Leaguer : a high Court, and a lower Court.

139. The lower Court shall be amongst the Regiments both of Horse and Foot, whereof every Regiment shall have one among themselves.

140. In the Horse-Regiments the Colonell shall be President, and in his absence the Captaine of our owne Life-guards ; with them are three Captains to be joyned, three Lieutnants, three Cornets, and three Quarter-masters that so together with the President they may be to the number of thirteene at the leaste.

141. In a Regiment of Foot the Colonell also shall be President, and his Lieutenant Colonell in his absence ; with them are two Captains to be joyned, two Lieutanants, two Ensignes, fourre Serjeants, and two Quarter-masters ; that together with the President they may be thirteene in number also.

142. In our highest Marshall Court, shall our General be President ; in his absence our Field Marshall, when our Generall is present, his associates shall be our Field Marshall first, next him our General of the Ord-

nance, Serjeant Major Generall, Generall of the Horse, Quarter-Master-General; next to them shall sit our Muster-Masters and all our Colonells, and in their absence their Lieutenant Colonells, and these shall sit together when there is any matter of great importance in controversies.

143. Whensoever this highest Court is to be holden they shall observe this order; our great Generall as President, shall sit alone at the head of the Table, on his right hand our Field-Marshall, on his left hand the Generall of the Ordnance, on the right hand next our Serjeant-Major-General, on the left hand againe the Generall of the Horse, and then the Quarter-Master-General on one hand, and the Muster-Master-General on the other; after them shall every Colonell sit according to his place as here followes; first, the Colonell of our Life Regiment, or of the Guards of our owne person; then every Colonell according to their places of antiquity. If there happen to be any great men in the Army of our subjects, that be of good understanding they shall cause them to sit next these officers; after these shall sit all the Colonells of strange Nations, every one according to his antiquity of service.

144. All these Judges both of higher and lower Courts, shall under the blue Skies thus sweare before Almighty God, that they will inviolably keep this following oath unto us: *I. R. W.* doe here promise before God upon his holy Gospell, that I both will and shall Judge uprightly in all things according to the Lawes of God, of our Nation, and these Articles of Warre, so farre forth as it pleaseth Almighty God to give me understanding; neither will I for favour nor for hatred, for good will, feare, ill will, anger, or any gift or bribe whatsoever judge wrongfully; but judge him free that ought to be free, and doom him guilty, that I finde guilty; as the Lord of Heaven and Earth shall help my soule and body at the last day, I shall hold this oath truly.

145. The Judges of our highest Court shall take this their oath in the first Leaguer, where our Campe shall be pitched; our Generall, and the rest appointed to set with him shall repaire to the place where we shall appoint, before his Tent, or otherwhere; where an officer appointed by us shall first take his oath, and then the others oathes also.

146. When the President of our lower Courts shall heare this foresaid oath read before them, then shall they hold up their hands, and sweare to keep it; in like manner, so often as any Court is to be holden in any Regiment, the aforesaid oath shall be read before all them that sit in judgment with him, who shall also hold up their hands and promise to keep the oath aforesaid.

147. In our highest Court, there shall be one Sworne Secretary appointed, who shall make a diligent record of all the proceedings that shall fall out either in any pitcht Battell, Skirmish, Leaguer, or any other peece of service whatsoever; he shall take the note, both of the day,

place, and houre, with all other circumstances that shall happen ; he shall also set his hand unto all sentences signed by our Generall ; he shall have also two Clerkes or Notaries under him, who shall ingrosse all these passages, and keepe a true Register of all enterprises, that our Generall with his Counsell of Warre shall give order to have done ; and likewise of what letters be either written or received.

148. In our highest Court there shall be one Vice-President, who shall command the Serjeant at Armes, whose office is to warne in all the Judges of the Court, that they may there appeare at the time and place appointed, and also to give the same notice both unto the Plaintiff and Defendant.

149. In all lower Courts also, there shall be one sworne Clerke or Secretary who shall likewise hold the same order that is mentioned in our highest Court.

150. Our highest Court shall be carefull also to heare and judge all criminall actions, and especially cases of conspiracy or treason practised or plotted against us, or our Generall either in word or deed ; secondly, if any gives out dishonourable speeches against our Majesty ; thirdly, or consulteth with the enemy to betray our Leaguer, Castle, Towne, Souldiers, or Fleet any way whatsoever ; fourthly, if any there be partakers of such treason or treachery, and reveale it not ; fifthly, or any that hath held correspondence and intelligence with the enemy ; sixthly, if any hath a spite or malice against us or our country ; seventhly, if any speake disgracefully, either of our owne Generalls person or endeavours ; eightly, or that intendeth treachery against our Generall or his Under-Officers ; or that speaketh disgracefully of them.

151. All questions in like manner happening betwixt officers and their Souldiers, if they suspect our lower Court to be partiall any way then may they appeale unto our highest Court, who shall decide the matter.

152. If a Gentleman or any officer be summoned to appearre before the lower Court, for any matter of importance, that may touch his life, or honour ; then shall the same be decided by our higher Court.

153. All civill questions that be in controversie in our lower Court, if the debt or fine extends unto five hundred Dollars or seventy-five pounds or above ; if the party complaines of injustice, they may thenceappeale unto the higher Court, if so be they can first prove the injustice.

154. All other occasions that may fall out, be they civill, or be they criminall ; shall first come before the lower Court where they shall be heard and what is there by good evidence proved, shall be recorded.

155. Any criminall action, that is adjudged in our lower Court, we command that the sentence be presented unto our Generall ; we will not have it presently put in execution, untill he gives command for it in our

absence. But our selves being in person there present, will first take notice of it, and dispose afterwards of it, as we shall think expedient.

156. In our higher Court, the Generall Parforce, or his Lieutenant shall be the Plaintiff, who shall be bound to follow the complaint diligently, to the end he may the better informe our Counsellors who are to doe Justice : if it be a matter against ourselves, then shall our owne Advocate defend our action before our Court.

157. The same power the Parforce of every Regiment shall have in our lower Court, which Parforce shall be bound, also to give notice of every breach of these Articles of warre, that the infringer may be punished.

158. Whatsoever fine is by the aforesaid Judges determined according to our Articles of warre, and escheated thereupon, shall be divided into three parts. Our owne parte of the fine we freely bestow upon the severall Captains either of Horse or Foot, which is forfeited by their Officers and Souldiers ; and the forfeiture of every Captain, we bestow upon their Colonell ; and forfeiture of every Colonell we give unto our Generall. The other two parts, belonging either to the party to whom it is adjudged, or to the Court, those leave we undisposed, the point of Treason onely excepted : and this gift of ours unto our Officers, is to be understood to indure so long as the Army be in the field, upon any strength or worke, and till they come home againe, after which time, they shall come under the law of the land like the other inhabitants.

159. Whensoeuer our highest Court is to sit, it shall be two houres before proclaimed through the Leaguer, that there is such an action criminal to be there tried, which is to be decided under the blue skies ; but if it be an action civil, then may the Court be holden within some tent, or otherwhere ; then shall the souldiers come together, about the place where the Court is to be holden, no man presuming to come too neere the table where the Judges are to sit ; then shall our Generall come foremost of all, and the other his associates, two and two together, in which order, they all coming out of the Generalls tent, shall set themselves down in the Court, in the order before appointed ; the Secretaries place shall be at the lower end of the table, where he shall take diligent notice in writing of all things declared before the Court ; then shall the Generall Parforce begin to open his complaint before them, and the contrary party shall have liberty to answer for himselfe, untill the Judges be thoroughly informed of the truth of all things.

160. If the Court be to be holden in any house or tent, they shall observe the same order in following the Generall in their degrees, where they shall also sit as afore mentioned.

161. The matter being thoroughly opened and considered upon, according to the importance of it, and our whole Court agreeing in one

opinion ; they shall command their sentence concerning the same action, to be publikely there read in the hearing of all men, alwayes reserving his majesties further will and pleasure.

162. In our lower Court they shall also hold the same order ; saving that the particular Court of every Regiment, shall be holden in their owne quarters.

163. In this lower Court, they shall alwayes observe this order ; namely, that the President sits at the bords end alone, the Captaines, Lieutenants, and Ensignes on either side ; so many inferior Officers also upon each side, that so they may the better reason upon the matter amongst themselves ; Last of all, shall the Clerke or Secretary sit at the lower end of the Table, the one party standing upon one hand, and the other upon the other.

164. So soon as the sentence is given the President shall rise up and all that sit with him, but doom being given by our Generall, that one of the parties must lose his head, hand, or the like ; then shall they command the Parforce to take him away to Prison, which done, the Parforce shall send unto the Minister, to desire him to visit the Party, and to give him the Communion ; but if the doom be passed in any lower Court, it shall be signed up unto the Generall in our absence, who shall either pardon the fact, or execute the sentence.

165. No Superior Officer, Colonell or Captain, either of Horse or Foot, shall sollicite for any man that is lawfully convicted by the Court, either for any crime, or for not observing of these Articles of Warre ; unlesse it be for his very neere kinsman, for whom nature compells him to intercede ; otherwise the solliciter shall be held as odious as the delinquent and cashiered from his charge.

166. Whosoever is minded to serve us in these Warres, shall be obliged to the keepin of these Articles. If any out of presumption, upon any Strength, in any Leaguer, in the field, or upon any worke, shall doe the contrary, be he Native or be he Stranger, Gentleman or other, Processe shall be made out against him for every time, so long as he serves us in these warres in the quality of a Souldier.

167. These Articles of warre we have made and ordained for the welfare of our Native Countrey, and doe command that they be read every moneth publickly before every Regiment, to the end that no man shall pretend ignorance. We further will and command all, whatsoever Officers higher or lower, and all our common souldiers, and all others that come into our Leaguer amongst the souldiers, that none presume to doe the contrary hereof upon paine of rebellion, and the incurring of our highest displeasure ; For the firmer confirmation whereof, we have hereunto set our hand and seale.

SIGNED IN THE LEAGUER ROYALL.

EDUCATION IN ITS RELATION TO THE MILITARY PROFESSION.

By PROFESSOR P. S. MICHIE, U. S. MILITARY ACADEMY.

[Read before the Institution, Dec. 10, 1879.]

BEFORE the late war had educated the people to a different belief, it was a popular notion that he who was of good stature, well-proportioned figure and handsomely uniformed, possessed all the requisites of a good officer. I well remember my first impressions of disappointment upon seeing an officer of the regular army. He was in civilian's dress, of medium height and of slight build. His appearance and bearing simply characterized the gentleman, and were not indicative of any special profession. To me he was not a Cæsar nor a Napoleon.

Notwithstanding our experience, we are apt to cling even yet to our early impressions, and almost unconsciously accord to the finely developed man all the mental virtues and accessories that seem the fitting inheritance of this favored individual. It seems almost a truism to say that education is as necessary in the military profession as in any other. Indeed, from the great variety of its duties, it is eminently so in this country, and yet I venture to say that a majority of well-educated persons of our acquaintance rather hold to the idea that the members of the so-called learned professions are by far, and ought to be, more highly educated than a corresponding number of equally prominent members of the profession of arms. Such is not our opinion. We, at least, are aware that a decent knowledge of our profession can be acquired only by continuous and well-directed study based upon a thoroughly grounded and liberal education.

When we who are parents, see the long years, devoted by our children, in gathering together the few simple elements

of knowledge—the struggles over the steps of rational processes, and the slow development of the emotional faculties, we are, no doubt, in some measure, distrustful of the methods in vogue whereby so little is accomplished, at so great an expenditure of time and money. With the boasted advance of modern times, they learn no easier, and in the end are in no way better educated than their predecessors of a former day. I am often asked to recommend schools for boys, where some progress in intellectual development can be assured, and I am as often at a loss for an answer.

Passing beyond the stage of childhood our colleges are boasting of new departures from traditional methods, and in consequence, there exists to-day a great uneasiness among those who are conservative in educational methods.

These changes in the theory of education are receiving strong support, not only from men eminent as presidents and professors of colleges, but by their actual adoption in famous institutions of learning, in our country; and while we cannot yet estimate the true value of these innovations, the fruit of which has not yet ripened, we cannot help being startled by their rapid growth and apparent strength.

As officers of the army we are more immediately concerned with education in its relations to our profession; primarily with regard to the proper preparatory mental culture, and secondly, with respect to the professional training of the future officers of the army.

Having been connected with the Military Academy now for some years, it has occurred to me that a brief explanation of its scope, and methods of instruction, would not be out of place, and might serve as an introduction to a proper discussion of this important subject. I therefore beg your indulgence while I touch briefly upon the two questions: Whence come our officers? and How are they educated?

1. *Whence come our officers?*

From an examination of the Army Register for the current year (1879) I find that of the 2,126 commissioned offi-

cers of the army, 1,123 have been appointed from civil life; 829 have been appointed from the Military Academy; 174 have been promoted from the ranks.

The records show that on the average about 4 per cent. of the number of officers vacate their commissions in active service each year, due to death, resignation or dismissal. This requires on a basis of 2,126 officers to an army of 25,000 men, our present establishment, 85 new appointments each year to fill the vacancies. The sources from which these come are: first, from *civil life*; second, from the *ranks* of the army, and third, from the *Military Academy*. As there are about 180 medical officers in the service, who are professionally educated for their positions, and of whose eminent qualifications there is no question, it is proper to leave this corps of officers out of the general consideration, and we have then about 1,946 officers, whose places are to be filled at the rate of 77 each year.

Of the 1,123 officers, now in the army, appointed from civil life, 984 have seen more or less active service during the war of the rebellion, of which number about 37, by our estimated rate of decrease, are yearly passing out of service. In 25 years, therefore, the profession will have lost the benefit of their personal labors, though their example and experience will still remain as a legacy to their successors. These gentlemen attained their honorable positions, through actual service in the field in the presence of the enemy. The knowledge of their profession, their skill in exercising its duties, and their gallant records were acquired under circumstances not likely to be repeated in our day, and as a future question of education their ability and attainments must be left out of the discussion, except so far as these exercise an immediate and possible future influence upon the army.

With regard to the officers promoted from the ranks they too, with but few exceptions, have worthily attained their commissions in actual war service, and can in all respects be placed upon a similar footing.

By a recent act of Congress the Military Academy is then the main source of our supply for officers, and this fact lends a great importance to its existence, its labors, its influence, and its necessities.

While, since the close of the war in 1865 only about 140 officers have been appointed to the army from civil life, who have remained in service, the academy has graduated 673 young officers, of which number 527 are still commissioned, while over 40 have been killed in action or have died from wounds or disease contracted in the line of duty.

The average number of graduates per year, since 1802, is 362; since 1842 is 41, and since 1865 is 48. The present organization of the academy will not change this latter average very much either way, and we may then assume as the quota of officers supplied by the academy to be for the present but 48 per year. This leaves about 29 officers to be furnished from civil life or by promotion from the ranks to make good the yearly deficit. If it be the policy of the appointing power to fill these vacancies, with young untrained and indifferently educated young men, or to reappoint, on the score of personal bravery, those who have been discharged the service, for immorality and intemperance, no consideration can be given to such an element in the service; and as during the present year of the 22 new civilian appointments, several had previously been found deficient and discharged from the academy due to incapacity, and nominations are now pending of officers, who from their moral character can reflect no credit on the service, the pertinency of this remark will be obvious.

At present the number of graduates in service amounts to 40 per cent. of the entire number of officers, and this with the 1 per cent. of increase each year, will at the end of 10 years make the number of such officers equal to the number of non-graduate officers, and thereafter the graduates will have the advantage in point of numbers.

It thus becomes a most important question to determine

what is the nature of the education by which these young men are trained, and what will be the possible future of the army which will, in the coming years, be controlled by them. This leads me to the second point and to the inquiry.

2. How are they educated?

To clearly present this matter to your notice, I can not do better than give the data, connected with the appointment, examination and admission of the cadets into the Military Academy; trace the influences of the education it supplies to them, and consider their qualifications and characteristics when the academy confers upon them its stamp of merited success, and turns them over to the army. Their subsequent career belongs to us, and we are responsible for their success or failure, according as the sentiment of the army is for continued effort in the line of progress, or is for the reverse.

The records of the academy permit us to go back only as far as 1838. From that time till 1879 the number of cadets appointed was 5,128. Of these, 609 either declined, failed appointment to report, or were found physically disqualified by the Medical Board, leaving 4,519 to present themselves for examination, to the Academic Board, in the English branches of a common school education. The result of these examinations was, that 932 or 20.6 per cent. were adjudged not duly qualified to enter upon their cadet life. Of the 3,205 admitted from 1838 to 1875, 1,716 or 53½ per cent. have graduated. During the past 10 years the failures for admission had become 37 per cent. of those examined, while the per cent. of graduates to the number admitted has risen to about 61, and is still on the increase.

From these data we gather the following facts, viz : That more than one-third of the young men, between the ages of 17 and 22, who are selected by the members of Congress as representative men of their districts, are incapable of passing a satisfactory examination in arithmetic as far as to include simple proportion, in geography, history of the United States, English grammar, reading, writing, and spelling;

that only *three* out of *five* of those who enter succeed in graduating in the prescribed course of studies; so that but 38 per cent. of the whole number appointed ultimately obtain their commissions. In this connection it is well to bear in mind, that inability to successfully master the course, is the only cause, which severs their connection with the academy before graduating. A very few do occasionally resign who have shown the ability necessary to succeed, but these form the rare exceptions. We are then entitled to conclude from this that the young men who are so highly honored do not as a general rule excel in scholastic requirements, but are rather below the average in mental range and calibre of those who present themselves for admission into Yale, Harvard, Princeton, Dartmouth, and many other colleges.

Now it is not for one instant to be supposed that any Congressional district in the United States does not contain many young men, who could creditably pass a thoroughly good examination in these elementary studies, and who would eagerly embrace the opportunity, if permitted to do so. While the subjects for entrance examination have not materially changed for forty years, the rigidity and thoroughness of the test has certainly increased in the last ten; but to offset this, education has become more general by the spread of common schools, and has thus materially enlarged the number of our youth capable of meeting these simple requisites. The failure must then be placed where it properly belongs, in the lack of interest in those who have the power of recommendation for appointment. In any system of examination, the line of demarcation between those who just fail and those who barely succeed must be rather indistinct, and this is shown in the 39 per cent. of subsequent failures to graduate which now exists.

Let us now consider the measures, employed to discipline, to instruct and bring this raw material into shape, during the four years that it is under the control of the academy, and learn something about the methods of this institution. Pos-

sibly no college in the country could exhibit in its entering class so fair an example of democratic representation. Here are found mingled together the sons of the poor and the rich, of the influential and the obscure, of the educated and the uncultured, in about the same proportion as in any community in the land. All are upon the same footing, receive the same impartial treatment in the new life, so strange, so restricted, and yet so full of ever developing interest. And in their progress, their antecedents are wholly absorbed, their individualities intensified, the whole forming one common stream of human life and action very typical of the country from which they come.

There is something in the air of the place which at first represses their natural characteristics, causing them to yield ready obedience to the unusual restraints now for the first time experienced. The scenery is grand and ennobling, and all their surroundings are most impressive. The pride and over-developed self-conceit which had been aroused by the sympathies and affection of their friends and relatives, get no immediate nourishment on their first entrance into military life. The details of their daily life are governed by orders and directions given in quick sharp tones, which are to them, but harsh and discordant. Ready obedience and the adaptability of youth soon soften the apparent vigor, the strangeness wears away, and the successful candidate soon begins to allow his inherent disposition to assert itself.

The problem now, is to develop in those who pass, each considered as a young man of sound body and mind, his healthy physique, his moral nature and his rational and intellectual faculties during the four years of his continuance at the academy, so that he will be capable of quickly comprehending and readily acquiring the duties of a subaltern officer, and from time to time, of performing the duties of the higher grades, as emergencies may arise.

There has been no question of the great importance and the great success that has ever attended the physical train-

ing of the cadets. They are perfect types of bodily vigor. The laws of health are well known, and the results of over 60 years experience illustrate the wisdom of the provisions of General Sylvanus Thayer in the admirable arrangement of the military drills as enforced recreations from study—in the regular hours for study—for meals and for rest in sleep. It is a serious error to imagine that these drills were established merely for the purpose of making experts in the evolutions of infantry, cavalry or artillery, while it is none the less true that the interest awakened and kept alive by the system of promotion to responsible positions of subordinate command results in emulation and thoroughness in the highest degree. Notwithstanding this I have heard officers maintain that the great value of the academy as a nursery for officers was embodied in this playing soldier on the drill grounds of the academy, altogether ignoring the much more important intellectual and moral culture obtained in its academic halls through the persistent efforts of the professors and instructors.

The *moral* nature is so far cultivated as to develop an honesty of thought and action, an uprightness of conduct, and the highest regard for truthfulness, not only in their relations to each other, but in all of the affairs of their lives. The means employed are by lectures on ethics, by worship and service on the Sabbath, and above all by the priceless legacy of truth and honor handed down from class to class as something sacred and not to be defiled. This phase of the inherent quality of the cadet has, as a practical virtue, a real and substantial existence, and is to-day recognized as one, almost phenomenal and peculiar to West Point.

The moral side of a man's nature demands the same kind of culture as his intellectual. Its laws require, before they can be accepted as a rule of life, similar tests as to their truth. Young men readily recognize morality and practice its teachings when the general sentiment of the community in which they live is in its favor, and the fact is, that

most of the cadets when they leave home, have had the advantage of good Christian training. It is undeniable, however, that there will always be some in the entering class, in whom the seeds of lying and other immoralities have germinated. But there exists, and always has existed in the corps of cadets, a *love* and *practice* of truth. This soldierly inheritance makes its presence known, at the dawn of the young cadets' career. He is taught not only by his superior officers, but by his comrades as well, that whatever be the circumstances, whether the mildest reproof or the severest punishment of dismissal threatens either himself or his comrade, *his* word must be unsullied, and be the full statement of the truth without evasion or prevarication. The ostracism attending the wilful lie can not be easily borne. *This* general sentiment of the corps keeps from *commission*, if not from *temptation*, those whose earlier education had not been of such a character, and implants in all a trust and confidence in each other that endure through life.

Again, there exists a manly respect in all for those who profess religious convictions and who live lives consistent therewith, and for those who hold conscientious views of duty, differing it may be from the generality. A prayer-meeting, numbering 70 members in a corps of 285, organized and maintained by the cadets themselves, independent of any supporting influence from without, indicates a remarkable condition in this respect among young men of active life and in vigorous health.

As to self-control and habits of command, these are inculcated and developed by the system of interior organization of the battalion, whereby the government and supervision is largely controlled by the cadets themselves. The duties of each cadet in barrack and camp life are so apportioned, that responsibility falls upon him, either as orderly of room, tent, hall, or subdivision, as squad marcher of section, as sentinel, corporal or sergeant of the guard, or in the various official positions to which he may be assigned in the battalion organization.

Next as to the intellectual training which is made of primary importance. The instruction embodies, *first*, the pure and applied mathematics to train the mind in exact reasoning, to lay the foundation of the higher professional training and to implant, as all studies of this nature do, self-reliance and confidence in the rational powers. The utility of the mathematical studies in a soldier's education is undoubted. They develop the ideas of ratio and proportion; as Prof. Challis says, "are fundamental conceptions of the human understanding, bound up with its power of reasoning on quantity. *Second*, two modern languages upon which to found culture and give to the student flexibility of expression. *Third*, physics to develop the habit of observation and impart a knowledge of the laws of nature, so necessary in any system of education, and *fourth*, the elements of professional instruction in law, ordnance and gunnery, the tactics of the three arms, military engineering and the art of war as a basis upon which to build a sound and enlarged knowledge after leaving the academy.

From this brief synopsis, we see that the range of the subjects is very limited. But this is more than counter-balanced by the thoroughness which is exacted in each study. It should be borne in mind that this institution is an academy and not a college or university—that its aim is *special* and not *general* education.

To see what weight is allotted to these studies in this problem of education, we will follow their sequence and briefly enumerate the periods allotted to them in the entire course.

By the 20th of June of each year the successful candidates are determined, and are at once divided into squads for drill, passing through all the gradations until they are fit to take their places in the ranks of the battalion, which is generally not later than the 1st of August. These daily drills, instil into the embryo officer the habits of unquestioned obedience, develop his erect carriage and lay the foundation of regular habits of life. Now, also, in contact and communion with

his comrades, he is taught the priceless value of honor and uprightness, and the soldierly regard for truth and honesty. His camp life, lasting till the 1st of September, invigorates his body, calms his mind, and prepares him for the ten months of study which are to follow. The class is arranged alphabetically and divided into sections of from ten to twelve members each. All the sections have at first the same task assigned, and until November, the efforts of professors and instructors are devoted to the first approximate arrangement of the class in order of ability, whether this be due to previous preparation or other inherent advantage. A general sifting, always going on, soon rearranges the strong in the upper and the weak in the lower sections, to meet the necessity of such assignment of tasks as will keep all fully employed.

The method of instruction is by recitation of lessons learned from text books carefully arranged and selected for the institution. Each day a specified lesson is assigned which is to be studied at quarters and recited the following day, to an army officer, selected on account of his special fitness and detailed by the War Department as instructor. Marks, indicating close range from *perfect* through *good*, *fair*, *indifferent*, *poor*, to *complete failure*, are given for each lesson recited, and these marks are posted on each Monday noon—open to inspection for a week—thus giving every student an opportunity to compare himself with his fellows and establishing the best possible guarantee of impartiality.

An analysis of the study of a single mathematical lesson, will give an insight into this method of instruction and teach us its true value. The regulations of the academy apportion the time of the cadet in such a way, that each task can and must be performed at specified times. When the hour for study, therefore, arrives, the cadet in his own room, wholly withdrawn from interruption of any kind, opens his book and begins his study. With pencil and paper at hand, he reads carefully each sentence, analyzes every statement, and

satisfies himself of the truth of each division of his lesson. Learning first his definitions, axioms, and fundamental propositions, he makes use of these to establish those which are dependent thereupon, and thus successively and consecutively he is made to acknowledge and receive the truth, through the mental effort of his reasoning powers. Having thus gone over the whole lesson, he returns, to *learn* it for demonstration to his instructor, grouping in this process, the various parts, into their several distinct propositions.

Passing by barracks any evening between call-to-quarters and tattoo, a glance into each room, shows the silent and studious room-mates at their table, hard at work, and the sentinel on his post in the hall; fine types of obedience, in letter and spirit, of these necessary regulations.

At the proper hour the cadet is called on to recite or to demonstrate, as the case may be, any portion of the given lesson. In this exercise he must be exact, logical, and thoroughly convinced of the truth he is to present—not restive under the frequent interruptions of his instructor—but holding himself well in hand to carry to a successful issue the subject of his examination. For, though this is called a recitation, it is in reality a searching examination—the instructor, for the time being, taking the rôle of the pupil, and the cadet exercising the function of the demonstrator. As a lawyer before a judge or jury attempts to establish his case by a clear array of facts, connected by sound and logical reasoning, so does the cadet, to obtain from *this* judge before him, the coveted prize of high standing in the well-matched contest.

The object of the recitation is threefold; *first*, to see that the allotted task has been faithfully studied; *second*, to train the cadet to present a clear, concise and methodical statement of his acquired knowledge, and *third*, to eradicate false principles that may have lodged in his mind, and replace them by the true. The mental discipline that is *thus* acquired is of the greatest value. The student does not ab-

sorb in a brief time a hazy knowledge of a mass of facts, nor is he permitted to present to his instructor an ill-digested statement of mere principles. But while it is true, that the first outcome is somewhat of this nature, the careful supervision of his instructor, and the certainty of a downward tendency in class rank, soon impress him with the true nature and importance of the perfect recitation. Many are at first surprised, to find that to give a rule for a mathematical operation is insufficient, and that the reasoning by which the rule is reached is necessary for independence of thought apart from the text. This first awakening from the bondage of authority was once wonderingly expressed by a cadet when to the inevitable "why?" of the instructor, replied "the book says so." "That is no reason," retorts the instructor. "Well," says he, "this is the first place I have ever been where the man is required to doubt the author." This fact is most pregnant. When one begins to doubt the author, he is then ready to believe in himself, and the instilling of this feeling of self-confidence is really the first "moving thing" in the creation of a rational man. Bit by bit a manliness of character and a mental structure are being reared which rest upon the sure foundation of knowledge, reaching down to first principles.

Study and instruction continue daily for ten months, Thanksgiving, Christmas and New Year's Day, Saturday afternoon and Sunday only excepted. Of the mathematical studies algebra is completed by January, plane and spherical geometry, trigonometry and surveying by June. Descriptive and analytical geometry by the following January, and the differential and integral calculus completes in June of the second year the pure mathematical studies. As subordinate to these in time devoted, and rank assigned, English grammar, rhetoric, French, topographical, perspective and mechanical drawing occur daily, so that each cadet has two daily studies, exclusive of drawing. Now intervenes for the period of the summer encampment a furlough of eight

weeks, for the cadet who has served two years at the academy, and who enjoys this happy time with all the heart and hopes of youth.

The third academic year is employed in the study of the applications of the pure mathematics, to analytical mechanics, acoustics, optics, physical and spherical astronomy—in the study of heat, organic and inorganic chemistry, electrics, mineralogy and geology—in drawing from models, shades and shadows, and free hand—and in the minor tactics of infantry, cavalry and artillery.

The final year is devoted to the elements of civil engineering, field and permanent fortification, strategy, grand tactics and the art of war—to constitutional, international and military law—to ordnance and gunnery and the Spanish language.

During the two encampments, known as the third and first class, practical instruction is given in surveying, in the use of astronomical instruments for the determination of mean-solar, and sidereal time, of latitude, longitude and the meridian ; in the construction of pontoon bridges, laying out field works and manufacture of siege materials ; in the preparation of ammunition for field and siege guns ; the determination of initial velocities of projectiles, and other practical ordnance laboratory work, and very thoroughly in infantry, cavalry and artillery drill.

The cadet, after he has given daily evidence of hard study, must pass a creditable examination in each subject, and is then recommended by the Academic Board for promotion in the several corps or arms of the service. The records, so minutely and thoroughly compiled by Gen. Geo. W. Cullum, of the 2,759 graduates, sufficiently attest that these recommendations have not been unworthily or unguardedly bestowed.

We can now see wherein the academy possesses certain advantages over the ordinary college. In the latter, owing to insufficient endowment, the struggle for existence and

solvency, and to the lack either of proper authority or the nerve to exercise it, this system of discipline can not be enforced. There is no question in my mind, not only as to its utility, but of its absolute necessity in the ideal school. Each cadet, because of the small number in the section, either does recite on an important part of his daily lesson, or so certainly expects to do so, that the risk of neglecting to study it is not for one instant to be entertained. The progress of each class is so systematic and regular, that it may be likened to the march of an army. If any soldier lags behind one day, he must on the next make double the distance, to reach his place in the column, or fall a prey to the enemy. In the college, with its divisions of from 20 to 40 men, under the charge of a tutor, oftentimes a recent and inexperienced graduate, it is impossible to so cross-examine all of his students, in an hour's recitation, as to enforce continuous study by all. This fact, united with the lack of supervision and control outside of the recitation room, coupled with the natural disinclination to severe mental effort, and procrastination inherent in young men, is a sufficient explanation of the inferior work, and hence indifferent mental discipline exhibited in the ordinary college graduate.

Education, is essentially mental and moral discipline. As to the former, it seems to me beyond question, that it can only be attained by continuous, well-directed and consecutive intellectual labor, and not by fits of study or cramming, combined with the excitements of boat-racing or athletic sports. Let any one exercise his body in a gymnasium daily for several hours without fatigue and his muscles would undoubtedly be developed in strength and elasticity, and if need be, he could strike a blow, overcome an obstacle, or perform any feat requiring expertness or energy, as the occasion demands. So, in like manner, the tendons and muscles of the mind, if I may use such a simile, which have grown harmoniously by the daily exercise of six or more hours study for four years, must respond in any emer-

gency in which the activities of the mind are requisite. The facts of knowledge, which any young man carries away with him from school, may be in time forgotten, and are in value insignificant, but in their acquisition something of greater value has been obtained which is retained through life. Now it is not claimed that all who enjoy this training are well equipped. The important element of capacity or—more generally the individuality of each—has to be considered. The inherent texture of the mineral determines the degree of polish to which it is susceptible, and the expenditure of countless labor will, after a certain amount has been bestowed, fail to produce any better result. What is claimed then, is, that so far as the individual himself is concerned, such a training is the best possible for him to fit him for the duties of life, whether civil or military. Since my connection with the institution more than 1,500 young men have been subjected to its restraints and enjoyed its benefits, and I have never yet known an instance where these have not resulted in positive good to the individual.

Next as to the incentives, which impel and compel each to his best efforts. These are pride, ambition, the certainty of discharge in case of failure, a support while acquiring an education, and the hope and prospect of a commission in an honorable service. In addition, the fact that no other certain avenue to the end in view is open in this country. In other institutions their reputations are derived mainly from their distinguished graduates. The general estimation of the academy, attained through many years by the untiring devotion of its pupils to the public interest, by their unselfish sacrifices, and gallant heroism, is constantly assailed by the public notice of the actions of its poorer graduates. The greater number of the graduates of colleges, from their absorption into the ordinary business of life, do not rise above the general level of the society or community in which they live, and hence contribute but little to its general reputation. No one inquires as to the

source of their education, unless their lives become more than ordinarily creditable. The result in recent years has been, therefore, to give a fictitious reputation to our collegiate institutions by attracting to their faculties men eminent in art, science and literature, whether they devote much or little time to making any personal impression upon the students by their own individual qualifications or not, and in a still more reprehensible way by the too liberal padding of college catalogues, as bait to attract the unwary student.

It would be, not only interesting but valuable to the cause of education, could the data be obtained which would show the ratio of admissions to alumni, the cause of separation before the completion of the course, the average amount of time devoted to the study of lessons, and the reasons which control the several curricula. Lacking these data, I am satisfied, however, from personal observations, that, in general, the average amount of study is far less than is *required* and *obtained* at the Academy. By so much as it is less, by so much is the true value of the best years of the student's life diminished, other things being equal. So, likewise, the new methods of elective studies permitted to pupils, *except in very special cases*, at an age when they need *discipline* and before their minds are sufficiently mature to be able to make a judicious choice, seems to me in the highest degree pernicious. With the indolence of youth as to strong mental work, the lack of proper individual direction, the majority must make mistakes that can never be rectified. Any faculty that deserves the control of a college certainly can more properly direct and establish a proper course of instruction that, being rigidly followed during the formative period of youth, must give a more rounded and complete intellectual development than any that can possibly be selected by the average student, swayed by the ignorance and prejudice inherent in this period of our lives. So far as can be judged, there seems to be prevalent a desire to make the road to learning easy and royal, and

while it is not to be disputed that every facility is freely offered in our best institutions to drink from the fountain of knowledge, there can be no question that this invitation is only quickly and eagerly accepted by those who have in them the inherent desire, while it is in the main unheeded by the greater number.

The academy has, however, by the wise provision of the laws enacted for its existence and establishment, a settled and determined work to do, and it does it. It has every advantage to carry on this prescribed labor, and there is no good reason why it should fail. If failures occur the fault lies with its officers in whole or in part, and no claim of superior merit is to be given to them for success. The character and excellence of its work must be based upon these facts, viz : the established standard for admissions fixed by law, considered both in relation to the age of the pupils and their necessary qualifications to make the selection as general as possible ; and the course of studies starting from this standard, arranged with reference to the ablest, the medium, and the most indifferent of those admitted, considered with reference to the end in view and the duration of the educational period.

These two are in certain degree correlated. For with respect to the first, owing to the present very great liberality and generality of elementary education, there can be no question that a selection of candidates can be made, without any additional restriction, which will certainly increase the per cent above 53 of those appointed, and this effected the percentage of graduates will increase both as to number and also as to quality.

Taking matters, however, as they stand, I can assure you then, of a certainty, from personal observation and experience, that the work done at the academy has not yet been equalled. It has as yet no rival in its methods. It stands to-day, as in the past, an institution of faithful, thorough and efficient education, doing the very best with the mate-

rial at its disposal, and it turns over to you, young men, carefully trained in mental discipline, to the highest level of their natural capacities.

I do not mean to imply, however, that better results for the end in view, may not be effected with our plant, and the present organization of the academy. It is undoubted, that with a more discriminating method of selection, an advanced standard for admission, and a corresponding change in the character of the studies, more especially in the line of professional culture, a very much higher standard for graduation could be effected with the same labor and at a much less expense: for it is a well known fact that the greater expenditure of time and ability in education is devoted to the poorer scholars, whose after careers do not in general warrant this disproportion.

Again, there are good grounds for believing that another year might be added to the course, in which, with the present standards, the professional training might be considerably advanced, without detriment to the cadet, the service, or the government. In no occupation or profession in this country is an independent support so soon acquired by a young man as by one favored with an appointment to West Point. But as these matters would lead to an extended discussion, not now pertinent to my subject, I content myself with their bare mention.

Now the pertinent question arises, what use do you make of these young men sent to the army from the Academy? Are they aided by the older and more experienced officers in the struggle for professional advancement, and in what degree? Here I leave the domain of certainty and enter that of probability, but probability based upon information gathered from sources that are unquestioned. Let us examine the facts. What is the career of a young man on entering the service? What are his opportunities for obtaining a practical knowledge of the duties of his profession?

On the 1st of October in every year, nearly half a hundred

well disciplined, well instructed young men seek the stations to which they have been assigned, enthusiastic in the highest degree. We grant that they have unbounded conceit at their successful graduation, but back of all that lies the proper animus to learn their duties and to do them, to the best of their ability. To the great credit of the service our young officers are in general received with real brotherly kindness and affection ; their inconsiderate mistakes and inexperience passed over, while the sympathy of comradeship smooths in many ways their new life until the assimilation is complete. But, it is in isolated cases only *I am sure*, that others are met with cold civility and indifference, their trivial errors magnified, and their gushing effusions about West Point chilled and destroyed by cruel and unfeeling aspersions against the academy, which for the time being fills their whole horizon, and thus the young officer's sympathies are checked, his honest ambition and desires unfostered, and his duties perfunctorily performed. What an opportunity for older officers to utilize this fresh outburst of vitality ! What a wealth of activity to be properly trained, guided and fostered ! What possibilities in the further prosecution of study when the applications lie so well and so immediately at hand !

But, it is not to be denied that the surroundings of the young officer in his first entrance into military life are in some instances the very worst possible. It has been the case, and possibly will be in the future, that his environments are those characterized in part by idleness, drunkenness and gambling, in the new post to which he may be assigned, and when we consider how often in the small isolated posts of the extreme frontier there is a lack of intellectual activity, of duty to perform, of incentive to do even the least that is required, the wonder is that so few fall into the pit that is open, and ever escape the wreck of moral and professional degradation.

It is not too much to say that the first year's service

leaves an indelible stamp on the young officer's career. This is due to the fact of military subordination and the inherent respect of the junior to the senior, which have been inculcated in the former during his period of education. Let him then be thrown in contact with those who neglect their duties, are the victims of vicious and immoral habits, and the tendencies to increase usefulness or greater proficiency in his profession, are either destroyed in their first sprouting or so frost bitten as to become dwarfed in their after culture. On the contrary, let his first surroundings be those of the active, the capable, the high-minded company commander, and the whole case is reversed. I therefore claim that as a supplement to the work of the academy, not less important is the function of the regimental post and company commanders of the army, and this in the direct ratio of the greater number of the small independent commands that exists in our service. The graduated cadet is not in any sense an officer. He is ready to become one, and his education has fitted him, in the best possible way, so far as he is individually concerned, to acquire most readily the knowledge and experience which are needed. A little kindly care and attention, a strict accountability for the performance of duty, with censure and commendation judiciously bestowed, will keep him on the proper road to credit and success.

Now there are many causes which conspire to destroy in the line of the army even a fair development of professional culture: whatever exists is creditable because it receives no nourishment from the representatives of the people. Without going into details we may say that among the principal of the causes are:

1st. In order to guard and protect the interests of the nation the army, already reduced in its resources and material to the last degree, has been separated into a vast number of small detachments, and assigned to many isolated posts in wild and desolate regions. Here usually a com-

pany or two exists, in discomfort, as a mere indication to lawless persons and savage tribes that there is a national shadow somewhere.

2d. The labor necessary for bare existence at these extreme posts, so absorbs all the available potential energy of the garrison that those who enlisted as soldiers find themselves laborers, and those who were educated as officers find themselves overseers—resulting in the loss of morale in the men and loss of professional pride in the officer. In fine, the quartermaster commands the greater part of the garrison, and his sway is absolute; with few or no books, no drill, no soldiers, what is there left for the officer to do? The slow promotion, the lack of mental stimulus and the rough life, tend to dissatisfaction and a readiness on the part of the more favored to seek other professions, better suited to a healthy ambition. To the men the avenue of escape is desertion; to the officer that remains in service, what? Now what remedies can be suggested? Of many which are proposed I have time only to call your attention in a very general way to the following, the first of which I understand has been advocated by the General of the army, viz :

The establishment of large posts within supplying distance of the smaller ones, at which may be stationed a sufficient number of troops to be exercised in company, regimental and brigade drill. One of the advantages of this is that a greater number of officers will be gathered together, and this will give rise to emulation, to professional study, to the formation of libraries, and all the other good effects that flow from wider contact with each other. Again the periods of isolated service at remote posts will be diminished, and advantages for professional culture that now seem so difficult to attain, afforded to every officer during his prime of life. And of far greater value than even the personal benefits to the officers of the present day, will be the priceless legacy of advancement which they leave as a body

to their successors; for as the advance of any age or community is necessarily an important factor in the age to come, we can only expect this progress in the future where there is something to base it upon in the present.

2d. The establishment of schools for cavalry and infantry, which can be located at these larger posts, and at which instruction can be carried on in all professional topics. With respect to these, I wish to call your attention briefly to the means employed in the British service to induce a healthy growth in professional study among their officers. From the reports of the Director General of Military Education on the Education of Officers, April, 1873 and 1876, I gather the following facts.

"Previous to the year 1871 very little assistance was given, so far as instruction to officers after entering the service was concerned. Due, however, to the report of the Council of Military Education, 16 garrison instructors were appointed to give instruction to officers in the United Kingdom and the Colonies, and 11 in India, upon the subjects of military law, field fortification, and military sketching and reconnoissance.

Up to Feb. 1872 the movement was of a tentative nature, but subsequently a system of two annual courses of four months was established, each followed by an examination, partly practical and partly by printed papers. "Libraries "of reference were established with a view of facilitating "and encouraging the study of military works by officers "so inclined. It has been already proved by the results of "the garrison instruction that the British officer is glad to "avail himself of means of instruction when offered for his "acceptance. This instruction, therefore, combined with "that given at the Royal Military College to all future sub- "lieutenants, will render it a matter of certainty that all "future officers of the English army will be professionally "educated, while it is very probable that many of the senior "officers, actuated by the feeling that they should not be

"less instructed than their juniors, will also apply themselves to the acquisition of such knowledge." These reports give also valuable information with regard to the examination of officers for direct appointment to the staff and to the requisites for admission of officers of the engineers, artillery, cavalry and infantry into the staff college. They impress the fact that there is a vigorous and lively activity existing in the British service calculated to improve the qualifications of its officers.

The same state of things exists in other European nations, and now we too must look alive to the interests of our profession on this side of the water. It is not sufficient for us to rest on the laurels gained in past wars, and supinely trust alone to the same Providence that is to be invoked by the enemy. And if the remark attributed to Von Moltke, in relation to the late civil war, was really uttered that he did not "concern himself with the movement of mobs," the confidence we have in ourselves is certainly not shared by the great strategist of Germany. Thoughtful men know full well that there is field for vast improvement, and opportunities are not wanting to bring about a decided change for the better.

Among the many instrumentalities available, I regard the establishment of this Military Service Institution as one of the most important, and I can not do better in closing, to express my idea, than in the language of a distinguished citizen, who referring to a similar association established at West Point, says :

" Its purposes are—to make common to all officers of our army the best fruits of the professional study, observation and experience of each. To develop and utilize in new spheres their talents for observation, generalization and statement, and by the exercise of those talents constrain the general public to accord to our arm of the public service in time of peace, the same measure of respect and gratitude it has always cheerfully accorded to it in time of war."

The officers in the service of the United States enjoy advantages for acquiring many kinds of useful information not within the reach of any other body of men of equal number, and which, if collected and properly edited, might prove of incalculable benefit, not only to the service but to the general public. At present, the best thought of our army is sent to Washington, where it is read by few, and is then consigned to a remorseless oblivion in the pigeon holes of the War Department. To the profession at large, a vast proportion of this work, as a means of instruction, is utterly lost forever. With every allowance for the exigencies of the service which discourage publicity, much of this work might be placed at your disposal to the great advantage of the profession.

The subjects to which attention should be invited to secure professional education, through this Institution, might be classified as follows :

1st. The topographical, geological, meteorological and climatological phenomena peculiar to the region under observation.

2d. Its natural history.

3d. The present status of the Indian tribes ; the influences tending to modify their numbers and condition, present and future.

4th. The best means of utilizing an army during a prolonged peace without impairing its efficiency.

5th. The functions and special duties of its different corps and parts, and how they might be modified to promote greater efficiency.

6th. The merits, changes and improvements in the art of war observed in foreign countries, and the best method of making them available in our service.

7th. Tactical and strategical lessons to be acquired from a consideration of the incidents of past wars in this and in other countries.

8th. What modifications in the education and training of

officers, experience indicates would be for the substantial benefit of the service.

9th. Biographical memoirs and reminiscences.

These are a few of the many streams by which information of incalculable value could flow into the reservoir of this society, and from it could be sent out to distant posts the careful compilations that would incite to new endeavors.

In conclusion, I have to say, that the subject here so imperfectly treated, is one that demands your most earnest attention. We must not regard the education of our officers as completed when they are simply capable of performing the duties of a subaltern. When the time comes that the nation looks to the army for its leaders of brigades, corps and armies, they must be found among our young, active, and well instructed officers. It is then that the investment of maintenance and instruction, during long years of peace, is returned an hundred-fold in the ability and competency to lead and command, and in the successes which are the direct consequences of careful, thorough and laborious study of the principles of the art of war.

GENERAL HANCOCK, *President.*

I have the honor to tender to you the thanks, unanimously voted of the members of the "United States Military Service Institution," and as President of that organization, to add my congratulations for your very able and instructive paper.

Discussion upon the merits of this paper being now in order, I may state that in my judgment the term of four (4) years at the Military Academy is sufficiently long. The strain prolonged another year, would not, in my opinion, be beneficial.

Graduates who possess extraordinary aptness or talent for specific studies in various directions might very well be permitted another year to pursue them, but that year should, I think, be spent at some other institution. I may state too, that I am not in favor of more stringent qualifications than those now required for the entrance of cadets to the Military Academy. I am of opinion that the system governing that matter at present, makes the academy more popular with the people than it would be if the entrance should be made more difficult. In reference to "com-

petitive examinations" for entrance to the academy, I have observed that, as generally carried out, they apply to the intellectual capacity of the applicants, rather than to the moral and physical qualities, which are so essential and important to officers of the army. On this point, I am inclined to believe that it would be more to the interests of the service if the members of Congress, having the appointing power, should themselves select those candidates who are personally known to them, to possess the proper moral and physical qualities (good intellectual powers being understood of course), than to throw the responsibility for selection upon a board of competitive examiners, the members of which may have no personal knowledge of the character, habits, and moral qualifications of the candidate, and, who may in fact, not be as capable of examining him in these essential matters as the Congressman who has the power to confer the appointment, and to whom the applicants (coming from his Congressional District) are generally well known.

GENERAL JAMES B. FRY.

Being called upon for remarks this evening upon the matter treated so ably and exhaustively by Professor Michie was wholly unexpected to me, and I am not prepared to enter at any length upon the general aspects of the subject. There is, however, one point frequently discussed and touched upon in the Professor's paper to-night, to which I will ask a moment's attention. It is the question of raising the standard of admission to the Military Academy. It seems to me that raising the standard of admission would not be quite consistent with the large claims we make in favor of the West Point *system* of education. We insist, and I think with good reason, that the great merit of the Military Academy in its intellectual relations is the *mental training* it affords; that in a way, and in a degree peculiar to itself, it develops the reasoning powers, gives the scope and grasp to the mind which enables it to deal promptly and vigorously with the various problems of life, as they may be encountered from day to day; and we attach a very subordinate importance to the mere acquisition from text books or lectures, of ascertained facts or accepted theories. We claim further that the extended and rigid course of mathematics prescribed for the academy, and the peculiar manner in which that course is taught, are the principal means through which the desired mental training is secured. These things being so, it seems to me that the best material the academy can have to work upon is that which can be admitted under a standard about like the present one, which, though low, gives as a general thing reasonable assurance of sufficient mental capacity on the part of the candidate to receive the West Point system and assimilate it in the easiest and most effective way. Of course the

more the cadet can receive of this system the better. I assume it is admitted, that speaking generally, the candidates who present themselves have acquired what knowledge they possess under a system entirely different from that of the Military Academy. That they have learned by rule and rote, or in other words that their education is to a great extent a course of cramming which I am inclined to think the common school system of the day is encouraging. If this is true, as I assume it to be, raising the standard of admission at West Point would be calling for more "cramming." The candidates would have to increase the amount of their acquirements, but of course could not be expected to change the system under which education such as theirs is given throughout the country. The additional cramming would not, it seems to me, facilitate the mental development aimed at by the West Point system, and might possibly have the effect of retarding it. Hence I suggest that the proposition to raise the standard strikes me as not quite consistent with the claims we make in favor of the system of instruction at the Military Academy.

GENERAL T. L. CRITTENDEN

I concur heartily in the vote of thanks to Professor Michie for his interesting paper, but I dissent altogether from the conclusion to which he comes. I seem to myself almost to take the position of that twelfth juror, who found himself empanelled with eleven such obstinate fellows that he could not agree with them.

The Superintendent of the academy at West Point, the visiting committee appointed by Congress, and now the distinguished Professor whose views we have just heard, all favor a higher educational standard for admission to West Point. I am constrained to think that this step is not only unnecessary but unwise, and would operate injuriously on the school and the service.

The Professor also suggests a fifth year's study before a class can graduate—and this also seems to me, would, be unwise unless the educational standard should be reduced, and the additional year be placed at the beginning instead of at the end of the course.

Mr. President the school at West Point is supported from the National Treasury. The poorest frontiersman as well as the millionaire sustains this school. We have men alive who entered the academy under a lower standard than the present one that rank with the foremost soldiers in the world.

There are many institutions in the country where young men who enjoy all the advantages that wealth can give, may prosecute their studies in Philosophy and Science after West Point has made them soldiers; there is nothing to hinder them from continuing their studies at one of these

eminent institutions. Indeed, at West Point itself, whose instruction is sufficient to open at least the gates to every field of knowledge, the graduates who show extraordinary capacity for acquiring knowledge might by being kept at the academy as instructors, prosecute their studies, and reach any attainable eminence without any further instruction.

In my judgment West Point should only be expected to impart such knowledge as is essential to make an accomplished soldier. If a graduate is ambitious of acquiring more knowledge as I have before said, the gates are open, and if he has the capacity and industry there is no obstacle which he cannot surmount without further instruction. Great scholars and great soldiers, however well instructed, at last make themselves.

I do not think it ought to be considered beneath the dignity of a young instructor at West Point to teach a young man who only knows how to read, and write, and cipher.

But few philosophers have been great soldiers. The patient study needful to acquire vast knowledge, seems to unfit a man for the active and exposed life of a great soldier.

It will hardly be contended that Aristotle could have surpassed Alexander as a soldier, but no one will deny his superior knowledge.

Mr. President I hope that West Point will remain as it has been, a great national school, open to all the able-bodied young men in the land even of limited education, who are ambitious of serving their country as soldiers.

PROFESSOR ANDREWS.

I concur with Prof. Michie in his opinion that provision should be made for the further professional instruction of the West Point graduate after he enters the army. However sound and valuable the foundation laid at the Military Academy, it is still only a foundation, upon which the superstructure is subsequently to be raised. I am of the opinion that the four years' course at West Point is preferable to a five years' course. The additional year would not do much to remedy that defective preparation of those entering the academy, which is now the great evil, and four years of the severe discipline necessarily maintained are enough. Additional instruction, the need of which is admitted, should be given elsewhere. However, opinions on this point will naturally vary, and possibly the fact that the course was for four years during my own service as a cadet, may have some influence upon my views.

Whether the additional year at the academy be given or not, there will still be much to be learned that cannot be taught until after graduation. It seems to me very unjust to the young West Point graduate to order him at once into the field, or to a small post, perhaps to the com-

mand of a company, without some previous opportunity to acquire, under faithful, able officers, some practical knowledge of at least the routine of duty in the army that he may be called upon to perform immediately after arriving at his post. Hence, the recommendation of the General of the army that camps of instruction be established, seems to me eminently wise. To such camps the young graduate could be sent, at the expiration of his leave of absence, with great advantage, both to himself and to the service. I also regard organizations like the Military Service Institution as of great value in stimulating professional research and discussion. While the object of eliciting the truth in regard to any subject should ever be borne in mind, yet papers advocating radical views should be admitted, as tending to arouse attention and provoke discussion.

As to the claim sometimes made that the standard of requirements at West Point is too high, it should be remembered that the academy is intended for the benefit of the whole nation, and not especially for the advantage of any one that personal or political influence may send there. The nation makes liberal provision for the support of the academy, and is not only entitled, but in duty bound, to see that the results of its outlay shall be the best attainable for its own interests. It does not suffice that the West Point graduate should be of sufficient ability, natural and acquired, to perform the ordinary duties in time of peace, of captains and lieutenants. The nation looks to the Military Academy to supply able men for high commands in time of war. See in the events of our civil war, abundant confirmation of the soundness of this view. See also the expressed opinions of successive Boards of Visitors, as to the inferior ability and defective preparation of a large proportion of the candidates for admission to the academy. It is certainly to be hoped, in the interest of the nation, that no such backward step as that of reducing the present moderate standard at West Point may be taken, until the expediency of such a course is shown to the satisfaction of competent and disinterested judges.

Prof. Van Amringe said that he deemed himself fortunate in having had an opportunity, through the courtesy of the Military Service Institution, of listening to so interesting and instructive a paper upon educational matters. While he might differ from Prof. Michie as to some of the incidental issues raised and discussed, he heartily approved of the paper as a whole, and thought the elucidation of the methods of instruction pursued at the Military Academy particularly admirable. Such methods should not be peculiar to West Point, but should prevail in educational institutions everywhere. Prof. Michie's estimate of the effect of such methods was just, as was shown by the history of graduates of the academy, who have become prominent, and justly so, in professions other

than the military, and notably in the profession of teaching. A certificate of graduation from West Point was a most effective, perhaps *the* most effective single recommendation that could be offered as to the fitness of an applicant for a professorship of mathematics, pure or applied. So marked and beneficial had been the influence of graduates of the academy upon education throughout the country, that a fruitful theme for a discourse supplementary to the one of this evening would be—the military profession in its relation to education in the United States.

STRATEGOS.

THE AMERICAN GAME OF WAR.

By LIEUTENANT C. A. L. TOTTEN, 4th Artillery.

[Read before the Institution Dec. 29, 1879.]

GAMES based upon strategic principles are by no means such recent expedients of instruction in military matters as at first appears. The game of *chess*, which from 600 B. C. has been the favorite of so many skillful soldiers, is in reality a "battle-game" in which the combined use and relative importance of various "arms" is the essential subject of study, while that of *checkers*, several hundred years more ancient than chess, is one in which the great underlying military principle of *decisive concentration at an opportune moment* governs the play. In fact, the special idea embodied in a "game of war" has long been in existence, and even in its more modern signification is far from being the result of these last few years of study and improvement in the principles of the science of warfare.

In the reign of Louis XV. two distinct military games, the Jeu de la Guerre and the Jeu de la Fortification were played in French military circles. Cards of various descriptions and values were employed in these games, drawings of which are still preserved in the Topographical Department of the English War Office. But these games do not seem to have had any resemblance to *modern* war-games, strictly so called, and could have exercised little if any influence upon the military education of their times. It will, however, no doubt surprise many to learn, that Kriegsspiel—the father of modern war-games—has been played in Prussia for at least half a century. This "war-play" (a literal rendering of its title) was originally the invention, early in our own century,

of a civilian, Herr Von Reiswitz, and its details were carefully worked out by his son, at that time a young Prussian artillery officer. The game came into general notice as early as 1824, receiving the attention of some of the highest officers and field-marshals of the day, since when it has rapidly grown into foreign military favor. Kriegsspiel is strictly an "*advanced* game," requires no inconsiderable military education before one can attempt to play it, and exercises nearly all the grand tactical, logistic and strategical information necessary upon an actual theatre of war. Some twenty-three independent codes of regulations now exist for the conduct of this game, but the principles maintained are more or less the same throughout them all. The game is played upon maps drawn to a large scale, battalions, batteries, and squadrons are represented by small metallic blocks; accurate tables of "rates of march," "distance," "casualty," "time," and other statistical data, govern its "movers," etc., and the element of *chance*, which so intricately enters into actual warfare, is introduced by an appeal to dice, thrown under certain rules and restrictions.

Over 20 years ago a society, with the celebrated Von Moltke as its president, was formed at Magdeburg for the express purpose of playing Kriegsspiel, and it is no doubt due to the increasing importance that has now for some years been attached to it, that the great skill of Prussian officers, and their success in two wars of magnitude may be attributed. It is a game which excites a spirit of emulation, leads to frequent discussions of military questions, and familiarizes officers with command and responsibility. Vast importance is now attached to this method of making the study of military science attractive, and it is understood that a certain familiarity with Kriegsspiel is even made a sort of requisite in Prussia, for military advancement. England and the Continental powers have followed Germany in this important lead, and to-day Kriegsspiel is attracting more attention than ever among foreign military people.

The introduction of this foreign game into our own country, though several independent efforts to do so have already been made, has not hitherto been a decided success. At Willet's Point, at West Point, and at Fort Hamilton some enthusiasm has indeed been excited, but it is by no means *general* even at these most favorable posts. Isolated copies of the game having been procured, the officers at these posts play it with more or less of professional earnestness. But no general interest has yet been awakened in the army as a whole, nor is there even the remotest possibility of exciting such interest among the members of that still larger, and let me say even more important military class in our country, the "National Guard" for whom Kriegsspiel must ever have little or no attraction. It is too difficult, too advanced, too complicated, requires too much preliminary information, and takes far too much time, to become popular with the citizen soldiers of such a country as our own. We cannot here enlarge upon, but in passing must allude to, the fundamental difference between our own military educational system and those of the continental nations. Indeed, let us admit the truth at once, we not only have absolutely *no* system, but as a people we seem honestly convinced that we stand in need of none. Abroad everything national is held subordinate to the wants of that iron skeleton about whose members the very nation aspires to round itself into a Hercules rather than a Cincinnatus, a Napoleon rather than a Washington. Abroad all the elements that circulate in the arteries of the body politic are soldiers ; from the cradle to the grave they learn war, practice its arts, and study its preparations. There the sword is never beaten *back* into a ploughshare. How different is it here, where we have well nigh already forgotten a struggle than which all history records none more fearlessly entered into, more sternly contested *à l'outrance*, or one that cost, relatively, more in time and treasure. And yet we are to-day as wholly and as deeply absorbed in the mild pursuits of peace, as yesterday we were with all our energy

and resource plunged into the ruder actualities of civil war.

Now it is due entirely to this fundamental difference that Kriegsspiel, though an "advanced study," and demanding of its players the highest order of military interest, finds so many devoted players in the numerous and vast military camps of Europe, and so few, acquainted even with its elementary principles, in the thinly soldiered and widely scattered "outposts" where the little American army still keeps its camp-fires bright, as though within the lines it *felt* that tens of thousands were yet sleeping on their arms. It is not strange then that Kriegsspiel should find numerous players among the thousands who pass annually through the Prussian military system. But the very dearth of military interest at present, in our country, is in keeping with our institutions, the state of the "profession of arms," and of military education among us.

How shall we reawaken the military interests of our people?

If not ridiculous then, it will at least be highly fruitless to expect Americans, who are now hardly familiar with the A. B. C. of elementary tactics, to become at once devoted players of what is certainly the most advanced form of military study.

But more than this, we believe it would be a most serious misfortune to the military interests of the country were our "National Guardsmen" as a body, induced to close their books of tactics, and skipping at one grand stride the whole intermediate region—the broad fields of military art, science, and history—essay the complicated and responsible studies of troop-leadership. We had far better remain a nation of able and reliable soldiers, willing to follow and to do, and anxious to learn, than become one of *poor* generals, which if we skip so much we surely will become.

An appreciation of these considerations some years ago lead the author of "*Strategos*" to attempt the study of this interesting problem from a purely American standpoint,

(the standpoint of American *needs*) and as the result of this study has but lately been made public a brief description of its outcome may not be unentertaining to members of the Military Service Institution. The word "Strategos," taken directly from the Greek words "stratos," *an army*, and "ago" *to lead*, was the *title* of an Athenian general officer, a general, an army-leader, a marshal.

In its secondary signification the Strategos was a council of ten Athenians, chosen by annual vote for the purpose of conducting the War Department. They were, in fact, a "Home-council" and executive "Board of War." From this same class of Greek roots come some of our most expressive modern military terms, such as strategy, strategography, strategics, etc.

The series of games, to which this name of Strategos has been given, is intended to afford assistance to both beginners and advanced students in prosecuting *consecutively* the whole study of warfare, its art, its science and its history, and then, *thereafter* affording them the means of applying the knowledge thus gained to practical study by methods as "*advanced*" as can be found. It will be noticed that its several games, or divisions, like their actual prototypes, blend and fade one into another so gradually and so naturally that the student will be almost unwittingly entrapped into continually higher and higher forms of *study* until at length the mere tyro, whose military horizon had always seemed to be so narrowed upon every side by the "Revised Upton" will find himself actually venturing to command an army, and essay with growing confidence those deeper, and more absorbing problems which alone test generalship and seal the fate of nations.

We say with growing confidence, for let it be noticed that in such a system there is no hiatus yawning all the way from a premature promotion out of an "awkward squad," to the utterly incompetent command of a theoretical Gettysburg!

It is on this very ground that we unhesitatingly claim,

what has already been admitted by two regularly appointed boards of American officers, that Strategos is far more comprehensive than the German game "Kriegsspiel," or its English version, "Aldershot"—both of which have now become so famous among foreign soldiers. Unlike these games, which have little in common with the ordinary soldier, the subaltern and the private military student, and were designed for the almost exclusive use of the best informed and most advanced members only of the military profession, the American game of war possesses an absorbing interest for those of every grade in the profession of arms, while in its most advanced application "Strategos" embodies all the more valuable features of these foreign games, introducing, at the same time, very many noticeable improvements upon both of them, and being thoroughly American even in its necessary similarities thereto.

It is almost hopeless to obtain a clear idea of the various games we have now to examine, without direct recourse to the material itself. I shall, therefore, only confine myself to this paper by way of preserving a consecutive development of the subject, asking you to accompany me to the games spread before us, and assist my hasty explanations by taking "object lessons."

We will first examine the outfit. It packs up into a very small space, and, as in every war-game, consists of various pieces representing bodies of troops, and the paraphenalia for convenient map study. It may be readily divided into four distinct parts, to wit: (1.) A set of military pieces (blue and red); (2.) A set of tactical and topographical blocks; (3.) A miscellany of special appliances of varying use in one or all of the general games; (4.) A text book.

(1.) The military pieces represent the more important tactical elements of two independent armies, with their baggage, standards, general officers, etc., etc. Infantry, cavalry, and artillery pieces may be readily distinguished from each other by their respective shapes or insignia, their sizes de-

pending upon the relative space occupied in line, column, etc. Most all of these pieces are made with "silicated" slate-surface, and are thus ready to receive any "*marks*" the players or referee may see fit to put upon them, as to "losses," varying "condition," "chances of success," etc.

(2.) The tactical and topographical pieces are made of thin strips of wood, about $\frac{1}{8}$ of an inch thick, and are of various sizes, ranging all the way from 1 to 8 inches in length, and from 1 to 6 inches in width. Each of these pieces is slated upon one side, (black), while upon the other, rivers, swamps, mountains, lakes, villages, etc., will be found topographically depicted in the proper military symbol.

(3.) This part of the outfit consists of scales, dividers, calipers, dice, counters, slated gavel boards, colored pencils, etc., concerning the use of which no explanation is deemed necessary, further than to state that they find special uses in the several parts of the game.

(4.) *The Text-book.*—This minutely describes the employment of the outfit in the six independent studies of gradually increasing importance which form one series of games. It is also intended to be a sort of general military "hand-book," being crowded with precepts, suggestions, data and tables, all of which have special and intrinsic value over and above their immediate uses in Strategos.

It is believed that this is the most complete system of material for studying the art, the history, and the science of warfare ever presented to the military public. Baron Jomini has defined strategy as "the art of making war upon the map," and developing this comprehensive idea to its fullest; the game of "Strategos" offers the military student a means of familiarizing himself with this art through all its phases and from every standpoint.

I. Applications of the outfit:

(1.) *The Tactical Game.*—"Strategos" begins with the novice at the very threshold of minor tactics, and accompanies him upward through all its varying phases as applied

to each of "the three arms." The second part of the outfit is specially employed in this division of our study, yielding perfectly to all the requirements of "dummy" instruction, and from the simple squad or detachment, up through the company, battery, squadron, and battalion, even to the army corps itself, considered as a tactical formation, affords a ready means of practical and unlimited elucidation.

During the first studies of a recruit, the various tactical pieces enable him, or his instructor, to exemplify promptly and clearly the positions and movements of officers and men in all the *manœuvres* of either branch of the service. It is intended that the black isolated sides of the several pieces shall be turned up in this study, and that according to their size they shall be employed to represent sets of trios or fours, platoons, companies, etc. The student himself must designate and employ these pieces to suit his necessities, all of which he will find have been anticipated by the outfit. For instance, the various officers and non-commissioned officers may be designated by name or insignia upon some of the slated disks, which same pieces may in turn be employed to represent, by number, the men in a "set of fours" (complete or incomplete) a "gun detachment," etc. Again, two of the four "XI" pieces joined together, and severally marked "1st" and "2d platoon," will, with the requisite quota of officers, afford us a complete company arranged for the study of the simpler movements in the "school of the platoon," which by increasing the number of such pieces (now representing generally "sets of fours") we may continue our tactical analysis down as deeply as we please. And so on upward or downward, through the several "schools" of either of the "three armies."

(2.) *The Grand Tactical, Topographical, and Strategical Game.*—Advancing now a step beyond their most elementary application, the same pieces may be employed by the student of strategy and grand tactics in his deeper investiga-

tions. The blocks are now turned over so as to expose their reverse sides, upon which the various topographical features are depicted. They are then to be used in conjunction with others, (tactical side up), to illustrate the various principles of strategy, affording to the numerous text books and authorities upon these subjects the same ready illustration that, with their tactical-sides up, they do to the manuals of tactics.

It is in this branch of study that these various pieces will afford the most valuable assistance to the ardent military student. With them he can more readily and understandingly master the definitions and principles of the science of war, and upon these as a foundation still further investigate the many considerations which affect and vary their applications in the practical experience of campaigning. With them he can investigate the rules that govern grand movements, dispositions for marching in advance, to the flank and in retreat, simultaneous movements, diversions, and the various special operations of war. With them he can study the influence of mountains, rivers, swamps, field-works, fortified places, etc., etc. With their assistance he can investigate the various battle formations for offence and defence, the advantages and defects of the twelve orders of battle, and how topographical considerations may modify them. And, finally, he can employ the various parts of the outfit in practically illustrating any of the conditions and problems of field-service in time of war, such as camping, cantoning, establishing outposts, grand guards, sieges, etc.

Few pencils have the skill or time to supplement extensive military reading and study; especially is this so in the brief time allotted to a recitation, and where diagrams are too expensive, or from the very nature of the case, entirely out of the question, one often has to forego that benefit which is only to be derived from copious illustration. It is particularly to meet this great want of the military student that this application of the Strategos outfit is introduced, offering him an unlimited means of rapid *object* study.

(3.) *Text-book Illustration.*—In this connection it may be stated that the topographical capacity of the outfit is such that it is an inexhaustible source of ready illustration for every text-book or authority (such as Jomini, Hamley, Wolsely, Halleck, Mahan, Dufour, etc.), upon military principles and precepts, so that diagrams which are utterly beyond the scope of even such books, can, with its aid, be realized in the simplest, most expeditious and lucid manner.

Such an application of the outfit will be especially appreciated by all who are actually engaged in teaching from these text-books at the various military academies and colleges throughout our country.

(4.) *Military History.*—Again Strategos will afford valuable companionship to those who are interested in the study of military history. Battles and campaigns can be analyzed with its assistance, and followed, step by step, and detail by detail, in a manner which it would be utterly impossible to realize even with the most extensive system of maps and diagrams. The power of illustrating any military historical topic will be limited only by the subject itself, while it will at the same time possess the peculiar advantages of both the tableau and the panorama, any and every feature of which may be modified at will. The above varied uses to which the outfit of this new game can be applied, will appeal directly to the great majority of American military aspirants, and satisfy a want that has long been felt, especially in our country, and one which the extremely complicated and advanced foreign games have utterly failed to appreciate. With an outfit, therefore, of such elastic capacity, there can certainly be no difficulty experienced in representing the various ancient and modern armies in any of their phases of formation, either tactical, grand tactical, or as influenced by topographical considerations; in accurately delineating the several orders of battle, and even of studying the latter over against each other, either arbitrarily or according to the principles laid down under the head of—

(5.) *The Battle-Game.*—This is a still higher application of the outfit, by means of which a most entertaining and instructive game, based upon military principles and precepts, can be played. Upon the large checkered game-board used in this application of the invention, two armies of any size and organization can be represented, with proper regard to lines, distances and order of battle, by squadron, battery and battalion, and (the various pieces having special moves and powers, and the whole progress of the game being governed by carefully compiled rules), a miniature battle can be fought, far less trying to ordinary patience than the advanced-game, and yet gradually educating the players up thereto. Without going into details we may state that the progress of this game is governed by the following general order of procedure :

1st. Two or more players agree upon the number of men to be employed on each side, the character of the battle to be fought, etc., etc. 2nd. The proper division of troops is made among the three arms, and the two armies "organized" into divisions, brigades, main-body, reserve, etc. 3d. Each player makes his dispositions in battle array behind a screen stretched across the middle of the game board. 4th. A *coup d'œil* reconnaissance is allowed to each player, of his adversaries lines, and any unmilitary dispositions are challenged. 5th. Rearrangements due to the reconnaissance are now effected. 6th. The screen is drawn aside and the players moving alternately a number of pieces, at once advance their armies into fire. 7th. Skirmishing commences. 8th. The general engagement comes on. 9th. The victory is decided by one or the other side capturing a majority of the hostile colors. 10th. Final dispositions are made and the course of the game studied and discussed.

The battle-game is really a compromise between a game and a study, between chess and "war upon the map." Its various features have been calculated with special reference to the subject illustrated. The rules of the game conspire towards concentration and arrangement, as a means of secur-

ing victory, rather than towards captures and losses, and the aim has been to make these rules *suggestive* of military ideas. Although the game is necessarily far more extensive than ordinary parlor pastimes, it is yet simple enough to be fully within the capacity of any military student, already even moderately familiar with the elements of the science of war, while the mere military novice cannot but be benefited, though seeking therefrom, perhaps, entertainment only for an evening.

The battle-game is intended particularly to give practice in organizing armies, making dispositions and in forming lines and orders of battle; to familiarize the player with the natural run of affairs during action; to sharpen the *coup d'œil*; to fix in the mind the individuality of each of the arms, their relative importance and the necessity of their combined use; to suggest practical and decisive concentrations at opportune moments; to afford field and opportunity for comprehensive battle plans; and, in a word, to inculcate generalship.

The several applications of the Strategos outfit thus far enumerated do *not* come within the scope of either of the foreign games already alluded to.

By them these applications are all completely overlooked in the haste to present an advanced, and necessarily very complicated game, to those few special students whose interest and professional studies may lead them to it.

The great mass of military aspirants will thus always fail to find interest in these foreign games on account of their complexity, and this fact in no small degree accounts for the extreme slowness with which Kriegsspiel, though now some fifty years old, becomes known in our country, even among officers of the regular army, who alone, perhaps, as a class, can afford to be constant players of it.

Strategos on the other hand is both an elementary and an advanced game, as elementary in its lower applications as the merest novice could desire. It moreover possesses this great advantage, that step by step it leads the player up through

minor tactics, strategy, and grand tactics, topography, military text-book illustration and study, history and the simple battle-game, until at last he is able also to attempt the *advanced* game itself.

These minor applications of the American game possess special recommendations for both regulars and national guardsmen in our service. They meet and satisfy a want that has always been felt among us. From time to time various appliances such as "automatic companies," "drilling apparatus," etc., have appeared, but have either been too cheap and rudimentary, or else at considerable expense have simply attempted to elucidate some one branch of this extended subject. Strategos is the first attempt to systematize the whole subject, and place at the command of student and instructor an outfit so comprehensive and elastic as to grasp at once the most elementary tactical details and the profoundest problems of campaigning.

(6.) *The Advanced Game.*—But Strategos having advanced thus far with the subaltern and the student, is not open to these objections, nor does it by any means neglect the special wants of the few whose extensive knowledge of the military art, science, and history, and whose more than passing object in studying these matters would demand the highest and most scientific application of the outfit.

With such an application, embodying all that is valuable in the German and English games, and introducing many new and noticeable improvements in the matter of method, men, tables, adaptability to American requirements, etc., the game of Strategos may naturally and does appropriately terminate. It is at this point that we first come in contact with modern "war games" strictly so called.

Its advanced game thus affords to the professional military man every opportunity that could be desired for pursuing studies, commenced in more elementary fields, to their legitimate termination.

In this, the last branch of the subject, therefore, all arbi-

trary assignments of values and moves are of course entirely out of the question and improper. The whole game is required to base itself upon actualities, upon the results of careful investigations, and upon the tabulated statistics of experience, of actual practice and of former battles and campaigns. Everything in such a game must be subjected to the most searching military scrutiny, and nothing is allowed upon the map which does not conform to the very best military information possessed and attainable. Each of the essential elements of distance, time, and topography, must have its peculiar weight duly considered, and throughout the directions, rules, order of procedure, tables, etc., etc., devoted to the playing of the advanced game, the constant endeavor will be seen to represent the mimic battle or campaign in all its features, save the dreadful wastes of blood and iron.

To enumerate only some of the more noticeable differences from additions to and improvements of *Strategos* as an *advanced game*, upon, *Kriegsspiel*, attention may be briefly called to the following points :

I. Though borrowing, as does the English game, such facts and data from the German as are necessarily common to all solutions of the same great problem—*actual warfare*—*Strategos* runs them into a more *elastic* mould, and also into one more suited to American military ideas and necessities. For instance, the method of consulting the dice in *Kriegsspiel* is far too *limited* and rigid. This is especially so in deciding hand to hand conflicts, while the more natural way followed in *Strategos* brings into the latter the *individuality* of the player, taxing his personal judgment, forethought and self-reliance and making a victory and its results, or a defeat with its consequences, depend in a special degree, not only upon the way in which a player has first handled his troops to increase his “*chance of success*” but compels him to *improve the opportunity* of handling those chances upon his own responsibility.

II. Its military pieces or “men” are based upon a princi-

ple which makes the capacity of the Strategos outfit absolutely inexhaustible. This is effected by means of the slating upon the back of each of the topographical pieces, and by the introduction of a sufficient number of slated *military* ones of each of the three arms, etc.

The slating is an entirely novel feature and is of incalculable advantage, putting it within the power of the student to *exhaust* any subject needing illustration and to recruit the strength of an army, or its sub-divisions to any limit.

Moreover the special value of a slated surface for keeping the record of the "results of victory," and "consequences of defeat" upon *each piece* (so that all over the map every little battalion and detachment shows at any moment its "*condition*"), is universally admitted by devoted players of the war-game as perhaps the solution of one of the most perplexing and apparently insurmountable drawbacks to rapid and satisfactory study.

III. The progress of the game is noted *in actual time*, as in minutes, hours, days, etc., instead of in "moves." This is certainly a more natural and *suggestive* means of study and instruction. In Strategos, for instance, the tables, rules, data, etc., will be found to state that it takes so many minutes, hours, days, etc., to accomplish so and so, while in Kriegsspiel the same statement would be made in terms of "moves." In the Strategos tables it is stated that a bridge 10 to 12 feet long, material at hand, can be built in ten minutes. In Kriegsspiel we find it requires "four moves." The *point* of distinction is this:—In Kriegsspiel we find the *game-idea* is paramount while in Strategos this idea is always kept subordinate to the real object of this advanced study—the actualities of the great archetype *warfare*, which is thus ever constantly in mind.

IV. For a similar reason *distances* in Strategos are all tabulated in *yards* instead of in "*paces*" as in the English rules. The term "*pace*" is very indefinite and has for some time been obsolete to American tactics, both grand and minor.

V. Strategos is conducted by direct recourse to tabulated ratios called "*chances*," and "*possibilities*," instead of the "index-points" as in Kriegsspiel. This latter term and method (the "index-point") fails utterly to suggest any military idea or correspondence that may be *recalled effectively upon the field*, and, again, is simply of interest in the game-room; whereas "*chances of success*" have deep meaning for the battle-field itself.

VI. Among other *new* tables, the employment of which lends additional interest to the American game, is that of "*results of victory*" and "*consequences of defeat*." This table comes in to the game as an arbiter in "hand to hand" conflicts, and tends to eliminate from the game that feeling of dissatisfaction and incompleteness universally complained of by those who rise up from the termination of a game of Kriegsspiel.

VII. The analysis of the circumstances of action is more thoroughly attempted by the tables and order of procedure in Strategos than in Kriegsspiel. If it be important to study "*war upon the map*" as Jomini has so aptly defined "*strategy*," then it is all important that the means afforded by an advanced game of war should unravel and analyze the conditions of the battle as perfectly as possible. Thus in the Strategos order of procedure we find such steps as the following:—1st. The *possibility* to advance is studied from tabulated ratios, and 2d, decided by the dice. 3d. The possibility to maintain position, and advance further is studied from similar ratios, and tabulated intervals, and, 4th, this in turn is decided by the dice. 5th. Hand to hand conflicts having at length come about, the "*chance of success*" on both sides are studied in tables and, 6th, these in turn are decided by dice, consulted in such a manner as to bring *individuality* into this all important crisis, just as it is necessarily *there* in real action. 7th, and finally, "*results of victory*" and "*consequences of defeat*" are studied and meted out by table according to the character of engagement and the amount of

success secured. The order of procedure contains in fact fourteen such sub-divisions with cross references throughout the rules and tables, so that it is as it were a "working" *index* to the game. An order of procedure is given in Kriegsspiel, but is so general and unsystematic that confusion of ideas is simply increased.

VIII. The tables of casualty are of actual *American* statistical value, refer to our own arms and experience and look, too, to the possible future of modern warfare where "magazine," breech-loaders, and "battery" field-guns will certainly play important parts.

IX. So too with tables of march, distances, etc., etc., and the several special tables of great statistical value included in the Strategos *text-book*, and which latter have no counterpart in the "rules for the conduct of the war-game" (Kriegsspiel), the facts and deductions are *American*, or are presented from an American standpoint for the use of those who in the future may, perhaps, find ample opportunity to remember upon the field all that they can learn in times of uneasy peace.

X. To sum up generally the whole matter, Strategos in its *advanced* application aims to be a complete assistance in the study of *strategy* as defined by Jomini. It purposely avoids becoming a game, as such, having completely satisfied the wants of those who merely seek amusement, or want it at least combined with study, in the four elementary applications of the outfit, and in the fifth and higher "battle-game." The *advanced* application of Strategos is no more of a "game" than is the midnight *study* of a general over his tented map and flaring candle for the battle of tomorrow.

The burden of military publications in our country is well known, and as it would be especially onerous in a case of this kind, should it be attempted without first gauging the possible demand, the game of Strategos is to be published entirely by subscription. It is desirable to issue the same

in as attractive a form and dress as possible, and while no expense will be spared upon the publication, should the requisite encouragement be forthcoming, such a venture cannot be initiated without the joint support of all who feel the need of an *American* "Game of War." By the advent of such a game a most valuable aid will be afforded to many in our country, who, in spite of the unmilitary tendencies of our institutions, are nevertheless earnest in the pursuit and preservation of military knowledge.

THE SCHOOL OF SUB-MARINE MINING AT WILLET'S POINT.

BY BREVET BRIGADIER-GENERAL HENRY L. ABBOT,

MAJOR U. S. ENGINEERS.

[Read before the Institution, Jan. 10, 1880.]

BEFORE referring to the torpedo establishment at Willet's Point, a few words upon the general subject of sub-marine mining will not be out of place.

Prior to our late civil contest, the torpedo had never played an important part in actual warfare. Bushnell in 1776-78, Fulton in 1801-7, and Colt in 1830-44, had all demonstrated by practical experiments the destructive effect of subaqueous explosions of gunpowder, and had urged the adoption of the torpedo as an important weapon to effect the destruction of hostile vessels of war; but neither in this country nor in Europe did the subject receive the attention which it deserved. It must be confessed that this was largely due to the professional opposition of officers of acknowledged merit both in the naval and in the land services—a fact which it is well for us to remember in passing upon the claims of new and untried inventions at the present day. Conservatism, although natural in well organized bodies, may sometimes be carried too far.

During the rebellion all the conditions were specially favorable to develop this novel mode of warfare. The preponderance of naval power on the side of the Union was overwhelming; and the theatre of war offered every facility for its effective employment both on the sea-coast and upon the great rivers which opened water lines of operation and communication throughout the whole Confederacy.

Exposed to attack on every side the Southern officers

naturally turned to the torpedo as a promising mode of obstructing their rivers and harbors; and with the energy and fertility of invention characteristic of Americans, they proceeded to develop the capabilities of the new weapon. The naval and land forces of the Union responded as best they could, under the less favorable circumstances which must always surround the attacking party.

This is not the place to dwell upon details, for which reference may be had to the printed works of Barnes, King, Von Scheliha, and others; but as no complete list of the shipping destroyed during the war has been published, the table on the next page, carefully prepared from all available authorities, and checked by the records of the Navy and War Departments, is not without value. I believe it to be essentially correct and complete.

Wholesale destruction, like that shown by this table, did not fail to attract the notice of every nation possessed of a sea-coast and a navy. How to make use of the new weapon to defend the former, and to increase the offensive powers of the latter, at once received earnest attention. The investigations thus inaugurated have been actively continued to the present day, but the results, as far as possible, are kept shrouded in mystery. Indeed it is altogether probable that until war compels a general showing of hands, not a few trump cards will never see the light.

Without a single exception among foreign nations, these investigations, and the practical service of the new weapons developed thereby, have devolved upon one or both of two classes of officers—the line officers of the navy and the engineers of the army.

Nations which have an extended coast, like Great Britain, Russia, Spain, and Holland, assign offensive torpedoes to the navy, and defensive mines to the army engineers. The German defensive system was organized by the engineers and transferred to the navy, because the parts to be defended were chiefly naval stations. In France a similar system

STEAMERS DESTROYED OR CRIPPLED BY TORPEDOES, DURING THE CIVIL WAR.

Date.	Vessels.				Injured.		
	Name.	Service.	Class.	Tons. No. of guns.	Where.	Extent.	Tor- pedo.
Dec. 12, 1862.	Cairo.	U. S. Navy.	Armored.	512 13	Yazoo river.	Destroyed.	Mine.
Feb. 28, 1863.	Montauk.	"	Monitor.	844 2	Ogeechee river.	Seriously.	"
July 22.	Baron De Kalb.	"	Armored.	512 13	Yazoo river.	Destroyed.	"
Aug. 8.	Com Barney.	"	Gunboat.	513 0	James river.	Disabled.	"
Sept. 1.	John Farron.	U. S. Army.	Transport.	3486 18	Off Charleston.	Seriously,	"
Oct. 5.	Ironsides.	U. S. Navy.	Armored.	0	"	"	Spar.
Unknown.	Marion.*	Confederate.	Unarmored.	0	"	Destroyed.	Mine.
do.	Ettiwau.	"	"	0	"	Seriously.	"
Feb. 17, 1864.	Housatonic.	U. S. Navy.	Sloop of war.	1240 13	"	Destroyed.	Spar.
Feb. 17.	Fish Torp Boat.	Confederate.	Torpedo boat	0	St. John's river.	"	Own.
Apl. 1.	Maple Leaf.	U. S. Army.	Transport.	508 4	"	"	Mine.
Apl. 6.	Gen. Hunter.	"	"	460	"	"	"
Apl. 9.	Minnesota.	U. S. Navy.	Flag ship.	3307 52	Newport News.	Internally.	Spar.
Apl. 15.	Eastport.	"	Armored.	800 8	Red river.	Sunk.	Mine.
May 6.	Com. Jones.	U. S. Navy.	Gunboat.	542 6	James river.	Destroyed.	"
May 9.	H. A. Weed.	U. S. Army.	Transport.	290 0	St. John's river.	"	"
June 19.	Alice Price.	"	"	380 0	"	"	"
Aug. 5.	Tecumseh.	U. S. Navy.	Monitor.	1034 2	Mobile Bay.	"	"
Oct. 27.	Albemarle.	Confederate.	Armored.	270 2	Plymouth.	"	Spar.
Nov. 27.	Greyhound.	U. S. Army.	Transport.	900* 0	James river.	"	Coal.
Dec. 8.	Narcissus.	U. S. Navy.	Gunboat.	101 2	Mobile Bay.	"	Mine.
Dec. 9.	Osceola.	"	"	974 0	Roanoke river.	"	"
Dec. 9.	Bazley.	"	Tug.	"	"	"	"
Jan. 15, 1865.	Patapsco.	"	Monitor.	844 2	Off Charleston.	"	"
Feb. 20.	Osceola.	"	Gunboat.	974 10	Cape Fear river.	Crippled.	Drift'g
Unknown.	Shultz.†	Confederate.	Transport.	0	James river.	Destroyed.	Mine.
Mar. 1.	Harvest Moon.	U. S. Navy.	Gunboat.	546 3	Georgetown.	"	"
Mar. 4.	Thorne.	U. S. Army.	Transport.	403 0	Cape Fear river.	"	"
Mar. 12.	Athea.	U. S. Navy.	Gunboat.	72 1	Blakely river.	"	"
Mar. 28.	Milwaukee.	"	Monitor.	970 4	"	"	"
Mar. 29.	Osage.	"	"	583 2	"	"	Drift'g
Apl. 1.	Rodolph.	"	Gunboat.	217 6	"	"	Mine.
Apl. 13.	Ida.	"	"	104 1	"	"	"
Apl. 14.	Sciota.	"	"	507 5	Mobile Bay.	"	"
May 12.	R. B. Hamilton.	U. S. Army.	Transport.	400 0	"	"	"
June 6.	Jonquil.‡	U. S. Navy.	Gunboat.	90 2	Ashley river.	Seriously.	"

* Blown up accidentally when planting mines (General Beauregard).

† Flag of true boat blown up accidentally by a Confederate mine when returning to Richmond with exchanged prisoners of war

‡ Injured while raising frame torpedoes

Two other attempts were made by the Confederates to employ the star torpedo against Union vessels of war. The first occurred on March 6, 1864, when the steamer Memphis was attacked in North Edisto river; and the second on April 19, 1864, when the steam frigate Wabash was attacked off Charleston. In both instances, the vigilance of the watch and the promptness of the officer in command, prevented the discharge of the torpedo.

On Aug. 9, 1864, three powder barges lying at the landing at City Point, were exploded by a clock work torpedo placed on board one of them by a spy. The destruction of life and property was terrible.

Earlier in the same year, a wharf boat at Mound City, Ill., was set on fire and destroyed in like manner. It was 600 feet long, and was loaded with stores and supplies for Admiral Porter's Mississippi squadron.

exists for like reasons. In Austria the service is divided between the two, as usual.

The natural interest of naval officers in this mode of warfare, and their peculiar fitness, especially for its offensive duties, is self-evident. The bearing of defensive torpedoes, commonly called sub-marine mines, upon the problem of coast and river defence, the familiarity with the water acquired by engineer troops from their duties as pontoniers and military bridge builders, and with the use of electricity and modern explosives from their special training in land mining, perhaps explains the reasons why the torpedo corps of the army has everywhere been selected from that arm of service.

Our own country has formed no exception to the general rule. Congress has divided the duty, in the same manner as in Europe, and has specially provided for the instruction of the engineer troops in "the establishment and maintenance of torpedoes to be operated from shore stations for the destruction of an enemy's vessel approaching the shore or entering the channel and fair-ways of harbors."

The first prominent officer in our service to invite attention to the value of sub-marine mines in coast defence was General Richard Delafield, late chief of engineers. In 1851, when major of the corps, he made use of the following language in an official paper upon the defence of our coasts : "A new agent—that of electro-galvanism—has come into use, enabling us to explode a shell or magazine of powder under water at any particular instant of time. This power may be made auxiliary in the defence of our coast, in the channels over which hostile vessels must pass in approaching our cities; but it can only be of use in connexion with forts, from which the electro-agent is worked, and from whence to protect the torpedoes until the proper moment of using them, as well as from whence to ascertain the exact instant of time in firing them. An undefended position will not admit of their successful application. It is an uncertain auxiliary in the defence of our ship channels, yet one that

would be resorted to by officers acquainted with its advantages. Gutta-percha elastic tubes, within which the wires may be protected, is another modern invention facilitating the use of the electro-galvanic mode of instantaneous explosion."

In his "report upon the Art of War in Europe in 1854-5-6," Major Delafield again brought the subject before the government in forcible language.

At the end of the civil war General Delafield, then chief of engineers, caused to be prepared and confidentially distributed, a compilation of the reports rendered by our officers in the field upon Confederate and Union torpedoes. This compilation, which was supplemented with other valuable information, was made by Major King, who under verbal instructions from General Delafield also conducted some novel experiments at Willet's Point designed to determine certain points connected with the explosion of gunpowder under water. These experiments were made in October, November and December of 1865; and they are especially interesting as being the first to prove that the use of the Rodman gauge can be extended to such researches.

When General Humphreys became chief of engineers, in 1866, he found our whole system of sea-coast defence in a transition state. Confidence in the power of existing masonry forts to resist the fire of the new artillery created in the struggle between guns and armor, was widely shaken; while recent instances of the passage of land batteries by fleets propelled by steam, pointed to the absolute necessity of devising some effective obstruction to hold the enemy under the fire of such new and improved water batteries, as the investigations then in progress should result in developing.

The problems of experimentally determining the effect of modern ordnance upon our existing masonry forts, and of planning a system better suited to cope with the armored fleets of Europe were then absorbing the attention of the

board of engineers; but in May, 1869, when definite conclusions had been reached on these more pressing matters, General Humphreys instructed the board to investigate the general subject of torpedo defence, and to prepare detailed plans for applying the approved methods to the harbors of the United States. The commanding officer of the engineer battalion was associated with the board in this duty, and the troops were ordered to perform the work required in the trials. In December, 1869, the board submitted an elaborate project for conducting the investigations, which having received the approval of the honorable Secretary of War, has been carried into effect, and has resulted in our present torpedo system.

After the needful preliminaries had been determined, the board proceeded to study the several harbors; and projects for their defence have been submitted and duly approved. They comprise plans for preparing the forts to serve as secure operating stations, and maps showing the minimum numbers and the proposed locations of the mines. Several of the torpedo casemates and galleries have been constructed, and the rest are now awaiting the needful funds.

In 1873, Congress, acting upon the recommendation of the Honorable Secretary of War, made the first appropriation for purchasing such parts of the material as could not easily be obtained at the breaking out of hostilities; and since that date it has not failed to continue these appropriations annually. Most of the purchases are cared for at the depot at Willet's Point, but the more bulky articles are now sent for storage to the several forts where they will be used.

Congress, as already stated, has provided for the instruction of the engineer troops in the practical use of the new weapon, and has made annually for several years the needful appropriations. The school of application at Willet's Point thus includes a branch devoted to defensive sub-marine mining, where officers and soldiers receive the training needful to qualify them for this special service.

Such in brief, is the history of the system adopted for defending our harbors with torpedoes. It is to be noted—and too much stress cannot be laid upon the fact—that the new weapon is officially regarded only as an auxiliary, essential to the successful service of the water batteries. The mines are always placed under the close flanking fire of land guns, without which they could not be defended against a hostile fleet. Their function is to close the channel against a rapid passage of the enemy; and thus to deprive him of the advantages given by the invention of the screw propeller. While he is slowly attempting to open a safe route through the mines, he is exposed to the deliberate practice of the artillery; and, with a suitable modern armament of heavy guns and mortars, the result of such a contest can hardly be doubtful.

In one word, defensive torpedoes are to be looked upon as sea mines which engineers have borrowed from the old system of land mines, as an offset to the modern inventions; the screw propeller and the defensive armor of ships of war.

It remains to consider the nature and extent of the co-operation which may reasonably be expected from the navy in defending our chief harbors. That this will be of an important character no one can doubt, but that it must be special in its nature is equally clear.

All offensive operations requiring mobility will naturally devolve upon the available naval force, and that such duties will be effectively performed no one can doubt who is familiar with the admirable torpedo school at Newport, and with the personal character of our naval officers.

In defensive operations, vessels, whether armored or unarmored, if in an advanced position must be exposed to attacks from torpedo boats; while land fortifications have nothing to fear from this destructive class. To attempt to operate any system of sub-marine mines from a floating battery must, therefore, be unwise.

The sea cost batteries and their mines are analogous to

an intrenched line of battle ; where the defence has every advantage which can be prepared before the contest ; and where, flanking being out of the question, the decisive struggle must take place.

Again, however it may be with our larger seaports, there are many harbors and channels of secondary importance which the army will certainly be called upon to defend alone, for the reason that if our vessels be scattered among them the offensive power of the navy must be sacrificed. That this consideration will have a controlling influence is proved by the views heretofore expressed by many statesmen and naval officers of high distinction.

Thus Mr. Webster, referring to England in the war of 1812, said : " I was for giving her to know that we too had a right of way over the seas, and that our officers and our sailors were not entire strangers on the bosom of the deep. I was for doing something more with our navy than to keep it on our shores for the protection of our own coasts and our own harbors. I was for giving play to its gallant and burning spirit, for allowing it to go forth upon the seas, and to encounter on an open and equal field whatever the proudest or the bravest of the enemy could bring against it."

Admiral S. F. Dupont wrote : " I beg leave to express an emphatic dissent from all theories having for their object the substitution of active ships-of-war for permanent works. This would be placing the navy in a false position before the country, giving it duties to perform for which its organization is inapplicable ; preparing for its future discredit and loss through failure to execute that which should never have been undertaken, which is not embraced in the general scope and design of a naval establishment.

" To retain the navy for harbor defence was entertained at the commencement of the last war with England ; the opposition to do so sprung from the apprehension that it could not compete with the vastly superior English force upon the ocean. But at that time some brave and sagacious officers

in the high rank saved the navy from the fate that threatened it, and to these gentlemen it owes all its subsequent honor, usefulness, and prosperity. If any such ideas prevail, at this day, in or out of the profession, those holding them would do well to pause and consider what the navy would have lost, and what the country would have lost, if our ships-of-war had at that eventful period been deprived of the opportunity of filling so bright a page in the nation's history by their achievements upon the ocean."

In fine, in preparing the detailed projects for defending the harbors of the United States the board of engineers for fortifications has considered that the assistance of the navy can only be confidently expected in a few of the great sea-ports; and in them that it will probably be found to be the part of wisdom to keep the larger vessels in reserve behind the lines of sub-marine mines connecting the forts, which, it will be remembered, can always be safely passed by friendly vessels.

The small gunboats and steam launches, will doubtless perform the important duties of picketing the approaches, driving off boats attempting to injure the mines, and giving timely notice of the approach of larger vessels. In case of a determined attack, the armored vessels will steam into the best position for reinforcing the fire of the forts; and should a favorable opportunity occur, will pass over the mines and give battle to the enemy, being sure of a safe refuge in case of reverse.

The foregoing considerations sufficiently explain the reasons for the establishment of a school of sub-marine mining at Willet's Point. A brief outline will now be given of some of the more important investigations which has been conducted there to develop this new branch of national defence.

The first subjects of study were to determine the best explosive for use in sub-marine warfare; its destructive range against a first-class modern ship-of-war, built of iron upon the double cellular principle; and the effect produced upon

this range by variations in the depths of water, the submergence of the charge, the material of the envelope, the air space in the torpedo, and the nature of the fuze—in a word the laws governing the effective transmission of the energy developed by the explosion through the water to the vessel, and the minimum amount of this energy which may be regarded as certainly destructive.

Nothing can be accomplished in such an investigation without numerous and accurate measurements.

Major King had already shown that the Rodman gauge could be used under water; but certain difficulties which he had encountered indicated the necessity of modification in the apparatus before it could be employed with large charges. These modifications, and a new method for determining the scale which avoids the theoretical objections pointed out by Prof. Bartlett to the use of a compression machine, were successfully accomplished.

It was inferred at the outset—and experience has abundantly confirmed the truth of the inference—that in order to secure determinate results the gauges must be held rigidly in position when acted upon by the shock. Different methods were adopted.

In the first, the charge was lashed in the centre of a stout wrought iron ring (3 ft., 4 ft., 5 ft., or 6 ft. in diameter) upon which six gauges were secured in such a manner as to point directly at the charge. This apparatus was suspended in a vertical plane at any desired distance below the surface, by wire rope connected with a wrought iron buoy. By this method any particular experiment could be repeated as often as necessary under identical circumstances; and any single element could be varied without modifying the others.

Several hundred trials have been made with this apparatus, including comparative tests of mammoth powder, cannon powder, Oliver powder, mortar powder, musket powder, fine sporting powder, safety compound of the Oriental Powder Company, compressed gun cotton, dry and wet, granulated

gun cotton, nitro-glycerine, dynamite (2 grades), dualin, rend-rock (3 grades), vulcan powder (2 grades), mica powder (2 grades), hercules powder (2 grades), electric powder (2 grades), Designolle powder and Brugere or picric powder.

This list includes characteristic types of all explosives known to modern science which are suitable for use in submarine mining. In connection with many other tests covering wetting, freezing, long storage and sympathetic explosions the experiments have shown that dynamite No. 1, consisting of 75 per cent. of nitro-glycerine and 25 per cent. of keiselguhr, is the best for our service.

In so extended an investigation many new points have naturally been developed, but only a few of them can be mentioned here.

The fundamental distinction between explosive mixtures and explosive compounds is strongly marked in subaqueous explosions. The former burn gradually, and with any strength of envelope likely to be used in sub-marine mining only a small fraction of the theoretical potential energy can be utilized, even when many well distributed points of ignition are employed. The compounds, on the contrary, when detonated waste but little of their full strength. This difference renders hardly possible any direct comparison between these two classes when fired under water.

The element of time, even with explosive compounds, has proved to be of extraordinary importance. Thus nitro-glycerine exploded under water develops but little more than $\frac{1}{10}$ of the intensity of an equal weight of dynamite No. 1, thus suggesting the apparent paradox of a part being greater than the whole. The explanation is believed to lie in the fact that its action is too sudden to be well suited to a resistance like that opposed by water.

The interposition of a stout wooden case between the charge and the water reduces in a surprising degree the kinetic energy available for effecting destruction upon an exterior object. Thus, with small charges of an explosive

compound, a wooden case 2 inches thick absorbs from 40 to 55 per cent. of the energy registered upon the guages when a tin case is used.

To determine the laws governing the transmission of the shock horizontally through the water to considerable distances, a light wrought iron frame 50 ft. long by 10 ft. by 10 ft. was employed. The charge was secured at the central point, and 36 guages, placed symmetrically with respect to a horizontal plane passing through it, were rigidly secured at the angles between the transverse frames. This "crate," so called, was suspended below the water surface by two buoys, and charges of dynamite varying from 5 lbs. to 100 lbs. were exploded, and the intensities of their action measured.

A close study of many experiments with the apparatus above described has fixed the numerical values of certain constants entering a general equation framed upon well established mechanical principles; and has proved that one and the same formula can be applied to all the modern explosive compounds by substituting the proper numerical value for a single constant.

This discovery has rendered it easy to fix the relative value of the several explosive compounds, and to compute for each the intensity of action which the explosion of a known charge at a known distance will develop in any known direction.

The complete solution of the problem of destructive range for subaqueous explosions required, in addition, that the intensity of action needful to destroy a first-class modern ship of war should be ascertained.

To determine this intensity, an iron target was prepared representing a section twenty feet square from the bottom of the Monarch, a vessel constructed upon the double cellular principle. This target was so moored as to secure by the use of heavy anchors and chain cables, strained by a tidal lift, much greater stability than would be given by its own weight; and a systematic series of tests was conducted

in the years 1875-7. One numerical value for the intensity of action needful to effect destruction was thus deduced.

The English official tests upon the Oberon, conducted during the years 1874-6, were reported in professional journals and the daily papers in so great detail that by the aid of the formulae above mentioned a satisfactory discussion of them was possible, although the official conclusions reached by the royal engineers have never been publicly announced. In this manner a second and independent value of this important element of the problem was secured.

Certain preliminary trials conducted at Willet's Point upon a very strong wooden raft afforded a third value.

These three determinations were so accordant that we have reason to be satisfied with the value finally adopted by the board of engineers; and the size of the charges for our mines and their destructive range have been fixed accordingly.

The subject of the torpedo or mine envelope has received much experimental study.

The three essential conditions are: endurance when exposed to the destructive action of sea water, waves and tidal currents, strength and adaptation of the several parts to resist the shock of explosions in the vicinity, whether of neighboring mines or of counter-mines fired by the enemy; and strength to resist such blows as would be given by friendly vessels in passing.

Various patterns have been constructed and subjected to practical tests until all these conditions are satisfactorily fulfilled. These experiments have covered a period of about six years, and the torpedo finally adopted is believed to be superior to any in use abroad of which we have knowledge.

For fixing the amount of buoyancy to be allowed in currents of various strengths careful measurements were made at Hell Gate on several successive days. All the variables entering the formula were thus measured for a range in velocity ample for any of our harbors; and our

co-efficient of buoyancy is thus based upon actual measurement and not upon theory.

Supplementary to these trials, measurements have been made by the engineer department in all our principal harbors and roadsteads to determine the velocity of flow under the most unfavorable conditions for the use of torpedoes and the results are considered in ordering the construction of the local mines.

Our torpedoes thus experimentally developed consist of two kinds—ground and buoyant.

The former is a segment of a cast iron sphere resting on the bottom upon its truncated base. It serves both to contain the charge and to furnish an anchor for a buoy floating above it which carries the electric device to determine the explosion when struck by an enemy. The charge varies, being usually 200 lbs. dynamite.

The buoyant torpedo is a sphere of steel of a size suited to the strength of current of the roadstead where it is to be placed. It is held in position by a wire rope attached to a cast iron mushroom anchor. The charge is 100 lbs. of dynamite.

To convey the electric current from the shore, use is made of an insulated cable not unlike those employed in sub-marine telegraphy. Many tests have been made to develop the best pattern of such cables—covering the insulation, the mode of jointing, and the needful armor.

It need hardly be stated that the active agent for firing the mines is electricity.

The subject of the fuze has been exhaustively studied— involving new methods of research and very extensive practical trials. Over eighty different patterns, foreign and domestic, have been compared and samples are now preserved in the museum at Willet's Point open to inspection by those interested in the subject. The pattern finally devised is well suited to the requirements of the service, and its action, even after remaining years in a torpedo, may

justly be claimed to be absolutely certain. Any deterioration would be revealed by the tests which can be made from the shore.

Special attention has been devoted to the apparatus for operating the mines, and as a system believed to be superior to any made public has been devised, its details are kept secret. It fulfils all desired conditions—such as allowing the safe passage of friendly vessels through the whole or through any part of the channel to be defended; the power to cause the mines to explode automatically when struck by a hostile vessel, and to fire any of them at the will of the operator; facility for rapid and frequent testing of the condition of every part, and for determining the locus of any injury whether to the torpedo or to the cable; and the novel feature of an automatic fire of the guns along the line of any mines or cables disturbed by an enemy. The latter would be of use during night or fogs when the garrison could not watch the sub-marine defences.

The operating casemate would be located in the most secure part of the fort, and the cables would be introduced in such a manner as to secure them from injury during a heavy bombardment. These casements and galleries have been made ready in several of the forts, and they will be prepared in all as soon as the funds are appropriated by Congress.

For the more important harbors the electric light would play an important part in the defence, and the subject has received attention for several years past at Willet's Point. The form of lense adopted is designed to throw a concentrated beam of light cylindrical in form to any desired part of the channel, and thus to reveal the position of the enemy and enable the artillery to destroy him by their fire. It has been found that on clear dark nights the aid afforded by the light is very great; in bright moonlight when good night glasses are used it is much less; and when the air is rendered opaque by moisture or diffused smoke, little or no assistance

can be derived from its use. The particles floating in the air are brightly illuminated and act as a screen to hide the object from view.

The laws making appropriations for the army branch of the Torpedo Service restrict the application of the funds to torpedoes "to be operated from shore stations for the destruction of an enemy's vessel approaching the shore or entering the channel and fair-ways of harbors." Care has always been taken to give this restriction a broad interpretation, and no experiments have been made with the spar torpedo or with the Harvey, Whitehead or rocket classes of which the range is probably too short to permit of useful employment from the shore. The fish class, however, which remains under control of the operator and has a range from one to two miles can be used either from the shore or from a vessel, and experiments have accordingly been made to develop its capabilities for land use.

The first pattern was presented in 1871 by the inventor, H. J. Smith. The motive power was liquefied ammonia contained in tanks carried by the fish and used to operate an ordinary propeller. No attempt was made to obtain high speed—the object being to determine whether the inventor had so arranged certain electro-magnets contained within the fish, and operated by means of an insulated wire, connecting with the shore and unreeled as it advanced, as to successfully operate certain valves by which the motive power was applied to the rudder or withdrawn at will. Several trials were made and the feasibility of controlling the direction of the motion was satisfactorily demonstrated.

Shortly after these trials were completed the Lay boat was brought forward, and was taken in hand by the naval authorities at Newport. Knowing that its capacity would be thoroughly developed by the officers at that station, no trials were made at Willet's Point, although requested by Mr. Lay, because they would involve a duplication of expense. The two establishments are authorized to communi-

cate freely, and full information as to the results of the trials was courteously and promptly given.

Very recently a new type of this class of torpedoes has been offered for trial at Willet's Point by Mr. Wm. F. Bridge of New York. This fish is driven by an electric motor contained within it and supplied by a dynamo electric machine on shore. This latter machine is driven by a small steam engine and the current is conveyed by an insulated cable payed out by the fish as it advances. The steering is effected by a small battery on shore which operates a relay in the fish and thus switches the current through steering magnets at the will of the operator.

The results of the preliminary trials have been very satisfactory. Under unfavorable circumstances an average speed of 8.8 miles per hour was secured, at times running over ten miles. The control of the operator over the fish was perfect. He could start, stop, starboard, port, and fire with only two insulated conductors, and without the objectionable features inseparable from a condensed motive power. The actual run was restricted to about 4000 feet, but no difficulty would be encountered in extending it to a mile or somewhat more.

The part which fish torpedoes would play in the defence of a harbor would be restricted in its nature, but under certain circumstances very important; and I regard it as a weapon certain to receive further development in the future.

By far the greater part of the destruction effected by the torpedo in actual warfare has occurred upon rivers with contracted channels. The problem of the best method of obstructing them has therefore naturally received attention. Where forts do not exist to protect the mines by their fire, any practical system of defence must be less elaborate than that already indicated,—and portable igniting apparatus would often have the preference. For this reason, special study has been made of the many machines invented for this purpose in Europe and this country. I shall mention

one of them patented by the Laflin and Rand Powder Company because in my judgment it is well suited to supply a need of the artillery in serving heavy ordnance. It consists of a dynamo-electric machine enclosed in a box about one-third of a cubic foot in capacity and weighing 18.5 lbs. The mechanism is simple and not likely to get out of order; and with suitable primers it may be depended upon to fire five guns instantly and simultaneously. The cost is trifling.

After thus briefly touching upon some of the more important investigations which have been conducted at Willet's Point it remains to consider the organization of the school of sub-marine mining. The latter constitutes a branch of the engineer school of application established at the end of the war for the instruction of the junior officers and the troops in their special military and civil duties. Officers on entering the corps usually serve for about $2\frac{1}{2}$ years at this post before being ordered upon other duty. They are immediately assigned to one of the companies; and thus become familiar with the ordinary routine of garrison service with troops while at the same time they acquire practice in many details of their profession which have been only theoretically taught at West Point.

In sub-marine mining the course is both theoretical and practical. Officers have the advantage of a very fine electrical laboratory, a small but good library, and a well arranged museum; and while instructing the enlisted men in their practical duties as a torpedo corps they acquire experience which will prove invaluable when the next war with a maritime power shall call upon them to apply the new system to the defence of the coasts.

The instruction of the enlisted men is also both theoretical and practical. Their duties require much special training, and care is taken to make this *individual*. It includes all the details connected with the loading and the planting of the mines in specified positions, the handling of the explosives and fuzes, the care of the voltaic batteries, the

repairs and jointing of the electric cables, the use of the telegraph and telephone, the mapping of the course of vessels as they pass through the channel—in a word every thing which requires special preparation in time of peace before any troops can be trusted to perform it in front of an enemy. Written reports are required weekly, from the officers on duty with the detail under training, and these are carefully filed and indexed; so that the individual knowledge and merit of every soldier of the battalion is continually a matter of official record.

Upon the approach of hostilities, young officers of engineers will probably be selected from among those who have passed through the course at Willet's Point, to plant and operate the mines at the channels to be defended.

They will be provided by the War Department with specific orders and plans showing the number and location of the mines, and will make requisition upon the battalion of engineers and the depot, for instructed enlisted men and the needful material.

Proceeding to their several stations, these detachments will report for duty to the commanding officer of the fort from which the mines are to be operated. The guns and torpedoes thus being under the control of a single officer, will be served together in a manner to ensure mutual support.

Officers of artillery and engineers who have seen service in the field, will remember the very intimate connection between the special duties of these two arms of service. We always found ourselves side by side working together to accomplish the same general objects—which were usually to assist in the most effective manner possible our friends of the infantry to perform the leading part which all military authorities concede to them as the principal arm.

In the defence of the coasts, the more conspicuous part will naturally devolve upon the artillery, but we of the engineers look forward to renewing our old alliance. While the big guns (now hoped for) are at work upon the enemy's

plating, our part will be to neutralize his propeller, and thus hold him as in a vice to receive the blows. If he becomes impatient and tries to advance a single yard beyond the point to which by blood and labor he has won the right of way, we will give him a death blow as sudden and appalling as that which carried the monitor Tecumseh to the bottom, in Mobile Bay.

But this is trenching upon forbidden ground. For obvious reasons it is not expedient to discuss in detail the methods which would be used to repel an attack upon a channel defended by mines. To be forewarned is to be forearmed in such cases, and it is best to leave the enemy to discover our devices himself.

In closing I may be permitted to refer to a plan often suggested but heretofore not acted upon, viz.: the sending of a few officers of artillery to Willet's Point to make themselves familiar with the details of sub-marine mining.

It is certain that the engineer officers charged with planting and operating the mines, will be sorely pressed by the multifarious duties devolving upon them. They must, at short notice, charter and equip a small fleet of tugs and row boats; hire not less than forty sailors and laborers for every grand group of mines to be planted simultaneously; distribute and frequently inspect their small force of trained engineer soldiers, who will be engaged in directing the operations of the loading room, the management of the tugs and boats and the cable jointing; supervise the electrical tests and the preparation of the casemate; arrange the triangulation needful for placing the grand groups in their true positions; see that the leading wires are properly disposed about the fort for the mapping, telegraphing, and automatic firing of the guns by night; in a word direct under great pressure a large force of men, mostly untrained, in the performance of duties requiring the utmost care, precision, and delicacy. It is true that at the same time, the few artillery officers who can be spared from light battery ser-

vice to defend the forts, will be more than occupied in instructing the new recruits, and training and providing for the volunteer organizations swarming to the forts to aid in the defence, but it is hoped and believed that a few officers, if properly instructed in mining, could be spared to assist the engineers in their duties.

Moreover, it will be of great importance that the commanding officer shall understand precisely what aid to expect from his mines and his engineer detachment.

For these reasons the artillery should certainly have some general knowledge of sub-marine mining before a crisis arrives. The engineer department, I believe, has always been in favor of granting permission to such officers of this branch of the service as can be spared from their regular duties and desire to do so, to come to Willet's Point to study the subject sufficiently for these objects ; and officers casually visiting the post, are always shown, confidentially, every part of the system without reserve.

I trust it is quite unnecessary to say that any officers, coming to Willet's Point to study sub-marine mining, would be heartily welcomed by myself and the garrison. In addition to the professional advantages sure to result from a more intimate association of different arms of the service, it is no small advantage to cultivate in this manner the feelings of personal friendship which in foreign armies seems to unite in a peculiar manner the artillery and the engineers. When at Chatham I found several royal artillery officers who upon their own applications were studying parts of the engineer course, and the system was commended by every one who conversed with me upon the subject.

REMARKS OF THE PRESIDENT OF THE INSTITUTE IN REFERENCE TO GENERAL ABBOT'S PAPER.

I have the honor to present to you the thanks of the United States Military Service Institution for the important and interesting paper you have just read.

As discussion is now in place, I may be permitted to suggest the in-

quiry, that, considering the comparatively small number of officers in our engineer corps, and the fact that other important military duties in time of war, would call the greater number of them away from the points where torpedoes would be used in defending our coasts and harbors, thus necessarily leaving to the artillery officers, in most instances, the management of such defensive appliances, whether it would not be well that the latter should, in time of peace, be instructed in their manufacture and use?

It would seem well, too, in connection with this subject, to inquire whether guns of the greatest power are as necessary for the protection of our coasts and harbors since torpedoes have been associated with them, as they were before the latter became a part of our defensive system.

REMARKS OF GENERAL DOUBLEDAY.

General Abbot having stated that shore batteries of heavy guns were indispensable as auxiliaries to torpedo defence, General Doubleday asked him if the engineers of all European nations did not coincide in this view, to which he replied in the affirmative. General Doubleday said he had called forth this statement as an answer to the erroneous opinion broached in the Chamber of Commerce of New York City, that torpedoes alone were a cheap and efficient defence, and that heavy guns were useless.

General Doubleday further stated in answer to a question of General Hancock, that in writing on the subject, his object had simply been to call attention to our imperfect forts and lack of heavy guns, but he did not come prepared on the present occasion to discuss details.

ARTILLERY IN THE EAST;
WITH SOME ACCOUNT OF THE FORTIFICATIONS OF
JAPAN AND CHINA

BY BREVET MAJOR J. P. SANGER, CAPTAIN FIRST ARTILLERY.

[Read before the Institution, February 19, 1880.]

BEFORE passing to the main part of this paper, it may be proper to remark by way of preface, that the subject is not one of which much can be said. Nevertheless I have determined to tax your patience and risk criticism, for the purpose of giving a brief account of the artillery of Japan, China and Persia.

It was my great privilege to accompany Generals Upton and Forsyth of the army, on an official visit to those countries three years ago, and I was directed by General Upton to report on the artillery and to collect such notes on the fortifications, as might be practicable.

It was subsequently made my duty to prepare reports on the artillery of Europe.

This was done, the reports have been duly submitted to the War Department, and authority granted to publish the information they contain. It has therefore occurred to me, following the idea so well expressed by General Fry in the last Journal, to prepare a series of papers on foreign artillery for the Military Service Institution, and to submit them for such action, as the Publishing Committee and Executive Council may think it desirable to take.

Through the publications of foreign scientific journals, and the notes of our Ordnance Department, the artillery material of foreign armies is generally very well understood by our artillery officers; but it is seldom, that anything

appears in regard to artillery organization and administration. In fact, I do not believe that a single connected or critical public account or discussion of the artillery personnel of foreign armies can be found in the English language, and for that reason my attention was chiefly directed to points of organization, administration and service, and I have commenced with the East, not because there is much to be learned from that quarter, but in order to follow the sequence of our journey.

Of course in a professional way we have but little if anything to learn from the nations of Asia, where the civilization of modern times, although knocking loudly for admission, has as yet barely gained an entrance or made an impression. Yet as showing the comparative progress of these nations in the path of military science since they have been brought more closely into contact with the outside world, an examination of their public institution is not wholly without interest.

For a general account of the organization of the armies of the East you are referred to the report of General Upton. The information contained in *this* paper was gathered from observation, in conversation with officers and other persons, and from the official notes furnished us by the respective governments.

A very casual inspection of the Japanese artillery will show that it is fashioned after the French, which is no doubt due to the influence of the two commissions of French officers who have for the most part organized and instructed it, and to the fact that a number of the Japanese artillery officers are annually educated at the artillery and engineer school at Fontainebleau. Similarly the Japanese navy bears the impression of the English and American officers who have been connected with it from the beginning of its modern development.

As in Europe, the affairs of the artillery center is the war ministry of the Empire, which is composed of six bureaus.

To the third is entrusted everything pertaining to the artillery, at the head of which is a lieutenant-general, assisted by a colonel or lieutenant-colonel, and which is divided into two sections.

The 1st section is charged with the personnel; the 2d section, with the material and expense account.

The artillery troops and establishments consist of one battalion, field artillery of the guard; nine battalions, field artillery of the line; nine companies of fortress artillery; the technical establishments; the Military Academy † for artillery and engineers; the Polygon, or school of practice.

THE FIELD ARTILLERY.

This forms ten battalions; each battalion consists of a staff and two batteries.

The organization is shown in the following table:

Designation.	Officers.						Men.				Total.		Aggregate.	Horses.	Guns.		
	Majors.	Captains.	1st Lieutenants.	2d Lieutenants.	Surgeons.	Pay-masters.	Veterinarians.	Sergeant Major.	Sergeants.	Corporals.	Trumpeters.	Privates.	Officers.	Men.			
	I	I ..	I ..	I ..	I ..	I ..	I ..	**	***	I	2	I ..	5	5			
Guard Battalion { Staff "A." { 2 batteries.	I	I ..	I ..	I ..	I ..	I ..	I ..	I	I ..	2	I ..	5	10	10	...	...
Total,	I	4	5	2	I	I	I	3	21	26	0	252	15	311	326	252	12
Line battalion { Staff. "B" { 2 batteries.	I	I ..	I ..	I ..	I ..	I ..	I ..	I	I ..	2	I ..	5	5	10	10	...	...
Total,	I	4	5	2	I	I	I	3	21	26	9	252	15	291	306	180	12

TOTAL PEACE STRENGTH, FIELD ARTILLERY.

1 Guard battalion "A"	I	4	5	2	I	I	I	3	21	26	9	252	15	311	326	252	12
9 Line battalions "B"	9	36	45	18	9	9	9	27	189	234	81	2088	135	2619	2754	1620	108
Total, 10 battalions,	10	40	50	20	10	10	10	30	210	260	90	2340	150	2930	3080	1872	120

† For an account of this Institution see the report of General E. Upton on the "Armies of Asia and Europe."

* Adjutant.

** Assistant paymaster.

*** One hospital steward, and one clerk.

The strength of the field batteries is nominally 156 enlisted men, though actually there are but 120 present.

The war formation of the Guard, field artillery, is the same as the peace; the other batteries are raised to the same strength by adding ten privates and ten horses.

All the guns are French muzzle-loading rifled 4-pounder bronze guns; weight, 330 kilos.

The batteries of field artillery are called on for mountain service; they are then armed with the bronze mountain howitzer; weight, 101 kilos, and the strength of the company is increased by twelve privates and twenty-eight horses. The horses of the Japanese artillery are all stallions about 13½ hands high, short coupled, with fine limbs and feet, and have great intelligence, strength and endurance. As the Japanese are of medium size, there is but little, if any, disparity in this respect between the men and horses, and although the horses are somewhat light for field artillery purposes, they are just what is needed for service in the mountainous interior.

FORTRESS ARTILLERY.

The fortress artillery existed only on paper, at the time of our visit, but when filled up there will be nine companies of 4 officers and 76 men each, giving an aggregate of 720 men. The organization is doubtless now completed.

THE TECHNICAL ESTABLISHMENTS.

These are under the orders of the war minister and consist of the Arsenal Tokio, the Arsenal Osaka, the Foundry Oji.

They were established in the early part of 1872, and constructed according to plans prepared by the artillery officers of the French commission.

As soon as the work shops were completed, a number of Japanese were instructed as machinists, carpenters, blacksmiths, and armorers. Their progress was rapid and satisfactory, so that between April, 1872, and April, 1875, over 600 workmen had been trained. It may be said that both

the arsenals are in fine condition, and during the year 1875 that at Tokio manufactured 93,000 caps for Chassepot rifles, 45,000 ball and blank cartridges for muzzle-loading small arms, 101,000 rounds for Snyder rifles, 4,000 pistols, 20,000 rounds of artillery ammunition.

In addition to the foregoing, the wood and iron work of two 4-pounder field batteries, a large number of musket stocks, besides repairing those in use. The arsenal at Osaka did even better. There guns are cast and equipments manufactured, and during the year, ending June, 1875, there were turned out, two hundred 4-pounder rifled bronze field guns; one hundred 4-pounder mountain howitzers, together with the wood and iron work of several field batteries and three thousand sets of harness and horse equipments.

Besides these establishments the Japanese are building a saltpetre and sulphur refinery at Mito, and will manufacture their own powder. With the exception of iron, the mines of Japan can furnish all the metals useful in the manufacture of artillery material, and sulphur and saltpetre in sufficient abundance to render the government independent of foreign markets.

Before 1868 several of the native princes (Daimios) possessed private foundries, and there are a large number of rifled bronze guns of that period.

The Polygon, or artillery school of practice, is modelled on those of Europe, a description of which is reserved for a subsequent paper. At a review of the Guard, we witnessed the movements of three batteries of field artillery, under the command of a Japanese major, and were most favorably impressed with the precision and excellence of the drill. The modes of attachment of the horses, the arms and equipment of the officers and men, as well as the tactics, are taken from the French, and are therefore not unlike our own. The uniform is also of French pattern, being of white cotton in summer, and of dark blue cloth in winter, while the ration is chiefly composed of fish and rice. The Japanese soldiers are of medium

size, and are brave and intelligent, and the officers persevering and enthusiastically devoted to their profession.

THE FORTIFICATIONS.

The fortifications of Japan may be divided into two classes, viz : those constructed centuries ago, by the Shio-guns and great Daimios, as places of refuge from the attack of powerful neighbors at home, and those constructed about twenty-five years ago at Tokio and a few other points along the coast, to repel foreigners.

The old forts do not differ much from each other except in extent. Usually they consist of three, and even four distinct enclosures, one within the other, arranged for flank defense and separated by broad moats or ditches. Access is gained by bridges. Occupying the highest point of the central, or inner area, is the citadel or castle, which was occupied by the prince when his safety made it necessary.

The embankments of the old works are of earth, from 20 to 50 ft. in height and revetted with stones, some of which, as at Osaka, are of cyclopean dimensions. The walls are defended by towers and bastions, or are indented at short distances and crowned with a crenellated parapet for archers. They are usually situated on commanding ground, and arranged with a sensible appreciation of its topographical advantages.

In all the forts, old and new, good wells of pure water were found, and in the safest part of the works.

It is estimated that the castle of the "Tycoon" at Tokio covers 8 square miles, which is $\frac{1}{4}$ the entire area of the city.

The modern forts are earth works, which were erected at points along the coast immediately after the first visits of Commodore Perry in 1853. The principal ones are in the bay of Yeddo, and were originally seven in number, extending across the bay in a line running east and west from a point about one mile off the Hamogaten palace Tokio, to a point near the village of Shinagawa ; the whole covering a front of about two miles. Having read that they were

hastily and very imperfectly constructed, it was surprising to find that these forts were redoubts, arranged so as to protect each other, built of earth, having exterior retaining walls of granite about 12 feet in height; that the mean thickness of the parapets was about 70 ft., with splinter proofs, and shelters placed in the ramps leading to the terre-plein.

The armaments were composed of old 42-pounders, mounted on modern carriages, purchased of the English. These forts are not now occupied, and are almost wholly neglected.

The following points on the coast are defended by earth-works, some of which have modern armaments, and are said to be quite extensive and well constructed. Tokio, Shinagawa, Yokohama, Nigata, Hakodadi, Kawagute, Hiogo, Hiroshima, Simoneseki, Kumamoto, Kagoshima, Nagasaki.

THE APPOINTMENT AND PROMOTION OF OFFICERS AND NON-COMMISSIONED OFFICERS OF ARTILLERY.

The non-commissioned officers are appointed from the military school, Tokio, after two years instruction, and are required to serve seven years.

The most capable pupils of the non-commissioned officers school enter the Military Academy, Tokio, by competitive examination, and if, after three years they graduate, they are commissioned lieutenants of artillery and engineers. Thereafter they are promoted according to seniority.

From this brief account of the artillery of Japan it will be observed that although not far advanced the Japanese have made an auspicious beginning, and have adopted as a model for their artillery one of the best organizations of Europe. No one can estimate the many difficulties that they and their European teachers have overcome, who is not familiar with the recent history of Japan. It is never easy to break down old traditions, and when in the performance of this sometimes imperative duty, it is necessary to change such venerable and respectable institutions as were the Japa-

nese, and to do this in a foreign language, and in the face of such intense aversion and reluctance as the Japanese at first manifested, the task seems well nigh hopeless.

No difficulties, however, have been too great for the French officers, who, from the first, won the respect and gratitude of their pupils, and who have never halted in their determination to carry their efforts to a successful close. Nor is this all; they have succeeded in infusing into the Japanese an enthusiasm which bids fair, not only to give them a fine army, but which will be the means of its preservation, and which will place Japan far in advance of the other nations of Asia, in her knowledge of the principles of military science.

CHINA.

It is said that the Chinese artillery has a regimental organization, in which there are regular and successive grades of command, from private to colonel. If such is the case I regret to say that I was not able to find either an actual, or paper organization of the artillery, although I made many attempts to do so.

There are a few field guns about Pekin, drawn by small Mongolian horses; of siege artillery there is none, and in fact the artillery officers and men we saw about the forts were for the most part without discipline or instruction.

A few Chinese youths of the better class are annually sent to the arsenal near Shanghai, where they are taught the use of the Krupp guns. Beyond this there is but little in the way of instruction, except at the Pei-ho forts, where we found an ex-sergeant of the Prussian army teaching artillery drill. The uniform of the Chinese is a loose jacket and trousers of blue generally trimmed with some other color. The officers wear a long double tunic with the insignia of rank embroidered thereon. They are also distinguished by the button of the cap and belt clasp.

MATERIAL.

Notwithstanding their apparent indifference to organization, instruction and discipline, the Chinese are by no means without arms and equipments, guns and other artillery material, and they have a number of large arsenals for the manufacture of ammunition, and stores. For their supply of cannon they depend chiefly on foreign markets, as thus far they have had no success in the manufacture of heavy ordnance. The arms and equipments of the Chinese army consist of spears, bows and arrows, swords and shields, matchlocks, gingals, musketoons, rifle-muskets, and sabres, with the usual equipment of cartridge boxes, belts, etc.

Like most nations who have passed from a semi-civilized state to one of greater enlightenment, the Chinese are fond of experimenting with modern weapons, while still clinging tenaciously to the old, and in this respect are entirely different from the Japanese who have abandoned all the war material which they formerly used in battle.

Nearly every pattern of musket (save our Springfield) which has a national reputation, is either in use or in store. Among them we saw the Snyder, Endfield, Remington, Spencer, Henry-Martini, and Chassepot. The bow and spear are now used mostly for show; but in actual service the matchlock and gingal are chiefly relied on, although both of these pieces are far inferior to modern small arms. The matchlock is a long wrought iron piece and is fired from a rest by means of slow match. As the powder pan must be uncovered before the match is applied, this weapon becomes nearly useless in wet or windy weather.

The gingal is an iron swivel from 8 to 14 feet in length resting on a tripod, and until the introduction of European fire arms was the most serviceable weapon the Chinese had. They are now being made shorter and with Remington and Spencer locks. At the capture of the Pei-ho forts by the Allies in 1858 a battery of 200 gingals was found in one of the northern forts.*

* Lord Elgin's Mission to China and Japan.

CANNON.

Of these there is a vast number, and a great variety; old and new: of modern artillery there are now in use 6, 12, 24 and 36 centimetre Krupp guns, the Broadwell, Armstrong, Buchum, Dalghren, Gatling guns, and French Mitrailleur, besides a number of smooth bores of English, Portugese and Chinese make. Two 10 lb. mortars were seen at the arsenal Tien-tsin but they are not in general use. It is believed by a great many people that the Chinese are probably the inventors of gunpowder, and it is said that they have always used the same materials and in the same proportions that we have, but not with the same results. Imperfect machinery has prevented a proper trituration of the materials, and therefore until quite recently they have had no success in making it useful for fire-arms. At present they have several powder mills under the management of foreigners, and are able to manufacture annually a large amount of very good powder, besides fuzes, percussion caps, and incendiary composition. This leads us to a consideration of the arsenals, which, after all, are the only interesting features of the Chinese artillery, and therefore may be briefly described.

THE ARSENALS.

There are five arsenals in China, located as follows: one at Tien-tsin; one at Nanking; one at Fou-Tcheou; one on the Wosung river, 6 miles above Shanghai; one at Canton.

The administration of all these arsenals is complex, the Chinese officials having charge of the discipline, pay and material, received and issued, while the direction of the work and construction are in the hands of foreigners, generally Europeans or Americans.

On the 23d of September, 1875, we visited the arsenal, near Shanghai, with Mr. Haas, the Austrian Counsel, who kindly consented to accompany us as interpreter. This arsenal was established about 13 years ago, and consists of a dock yard, ship yard, foundry, workshops and small arms factory, in which Remington rifles are manufactured. The

workmanship was good, and the pieces fairly finished. The foundry turns out projectiles and metallic fuze plugs, while small vessels are built and repaired at the ship yards. About four miles further up the Wosung is a powder mill, which at the date of our visit was required to supply 20,000 pounds per month.

October 19th, we visited the arsenal at Tien-tsin, which is located about two miles south-east of the city. It was established in 1868, and opened for work in 1870, and is devoted to the manufacture of powder, small arms, metallic cartridges, projectiles for cannon, and coast gun-carriages. Machinery for making Remington rifles was about being introduced, and it was expected that during the next or ensuing year (1876) this work would be commenced.

The arsenal grounds include about 640 acres, and are enclosed and protected by a parapet. It was very difficult to obtain trustworthy statistics of the personnel or work of this arsenal, or in fact of any of them.

The arsenal at Fou-Tcheou has played quite an important part in the naval history of China.* This establishment is not, as its name indicates, a manufactory of arms or ammunition for military purposes ; on the contrary it is a collection of docks, ship yards and workshops, specially set apart for naval purposes, and having in connection a metallurgic manufactory for the lamination of iron in bars and plates. It was further intended as a school for the instruction of Chinese subjects, capable of learning how to build and command naval and merchant vessels. It was also intended as a means of developing the mineral resources of the province of Fo-kien. It was designed by M. Giquel a French gentleman in the Chinese service, and was commenced at the beginning of the year 1867. From a report written by M. Giquel it seems that up to the end of 1874 there had been constructed fifteen naval steam vessels of from 250 to 450 horse power. The European personnel

* See report of M. Giquel.

of the arsenal during that interval aggregated about 80 persons who were skilled workmen in the various departments, and who were employed in teaching the Chinese and superintending their work.

M. Giquel commenced operations under a contract, in which he agreed that within five years a certain number of the Chinese officials and workmen should understand, not only how to construct a naval vessel according to a plan, and how to make the machinery needed in its construction, but also the principles of navigation. In pursuit of this object the following schools were established :

3 FRENCH SCHOOLS. { A school of design.
 { A school of construction.
 { A school of apprentices.

The School of Design had in view the instruction necessary to enable the Chinese to prepare plans. The course included arithmetic and geometry, plane and descriptive. Several hours each day were devoted to drawing, the pupils being required to represent the different parts of the machinery of the shops, etc.

The School of Construction.—In this school the pupils were taught to make computations of the functions and dimensions of different parts of a machine so as to be able to design and reproduce them ; they also studied physics.

The School for Apprentices.—This school was for younger pupils, in which they went over arithmetic and geometry, algebra, drawing, and a course of descriptive machinery.

3. ENGLISH SCHOOLS. { A naval school,
 { A practice ship.
 { A school of mechanism.

In the first named everything pertaining to theoretical navigation was taught, as for example astronomy, sailing by charts, geography, and the principles of geodesy.

In the second, all the practical details of managing a ship, the administration and discipline of the crews, and the practice of naval gunnery.

The object of the third English school was the more thorough discussion of naval engines, and the application of all theories to machines.

The report of M. Giquel indicates that he considered the Chinese capable, and that a few of the pupils made good progress. I learned from another source, however, that although quite enthusiastic at first, they speedily relapsed into indifference and forgot all save the mere practical duties of sailors.

In this brief account it will be seen, that the arsenal at Fou-Tcheou has accomplished something, though it is impossible to predict what permanence there may be in the plans or work, because the Chinese seem to care very little for modern improvements, and seem unwilling or unable to carry their investigations beyond a certain point. November the 4th we visited the arsenal at Canton, which commenced work in 1871, and is both military and naval. In contradistinction to the other arsenals, this is managed entirely by the Chinese, and consists of machine shops, foundry, and the machinery for manufacturing Gatling guns and *small arms*, of the following dimensions :

No. 1.—Length of barrel, 5 feet 8 inches; length of chamber, $2\frac{1}{4}$ inches; length of stock, 3 feet. Total length, 8 feet $8\frac{1}{4}$ inches; weight, 32 pounds. This weapon had a Remington lock.

No. 2.—Barrel 6 ft. in length; chamber $2\frac{1}{4}$ in.; stock 1 ft. 5 inches; calibre, $\frac{1}{2}$ of an inch, with Spencer lock.

These were no doubt modifications of the gingal, and were made by order of the viceroy of Canton against the remonstrances of the mandarin in charge of the arsenal, who was an intelligent man and seemed to understand something of the theory of small arms. He informed us *confidentially* "that the Viceroy thought more of the moral, than of the real effect of the guns and therefore insisted on having them of enormous size in order to frighten the enemy.

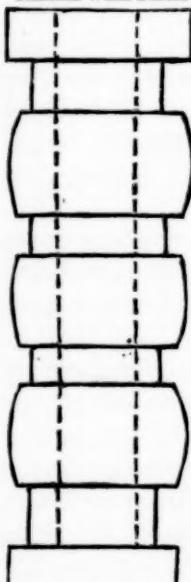
THE FORTIFICATIONS OF CHINA.

As in Japan, the defences are ancient and those constructed in imitation of modern field works.

As types of the ancient defences, may be mentioned the Great Wall and the walls enclosing the city of Peking.

The history of the Great Wall is so well known, and it has been so often visited and described that almost any reference to it seems out of place. As most travellers have discussed it as a curiosity however, it may be pardonable to allude to it as a means of defence. It is estimated to be 1200 miles in length, extending from a point, on the coast in the province of Liantung to Kiayünnan on the northern frontier of the province of Kansuh where it terminates.

Plate I.
CHINESE WALL PIECE.



Throughout its entire extent it is said to follow the irregularities of the surface, climbing the hills and descending into the valleys.

Within the province of Chilhi, the wall is double. The inner wall, erected during the reign of the Ming dynasty, corresponds in its features to the outer, with which it is parallel, and from which it is separated by about 15 miles of country.

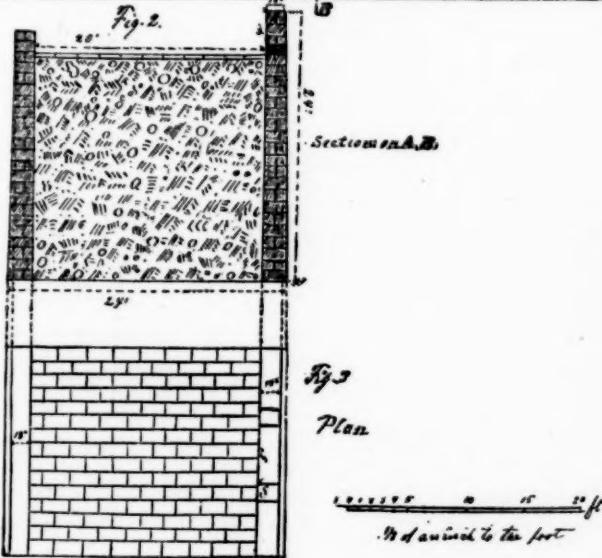
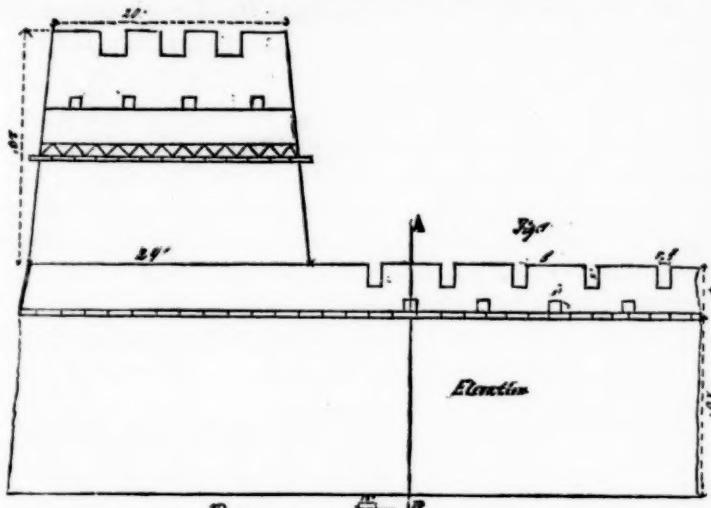
The material of which the wall is made varies with its situation, and depends on the natural resources of the provinces through which it passes.

The western portion is said to be more substantially built than the eastern, where in many places it is composed of mud or gravel, in others earth retained by brick.

At the Nankow Pass where we inspected it, the wall is of rubble stone and earth

NOTE, PLATE I.—This gun has the following dimensions : Length, 35 inches; caliber, 3 inches; weight, 150 lbs. (?) It is made of cast iron and has no marks, nor are there any carriages. These pieces were evidently intended to be fired from the terra-plein through the small port holes shown in plate 2, where some of them were found covered with debris.

Plate 2. PLAN, ELEVATION AND SECTION OF THE GREAT WALL.



between granite facings, and is in an excellent state of preservation. It is surmounted by a crenellated parapet of brick, pierced near the foot with embrasures for the reception of the small iron wall pieces, shown in plate 1, and which from their shape must be of Chinese make and of the earliest date.

The top of the wall is paved with broad tiles, shown in plan, fig. 3, plate 2, embedded in cement, and at points, where the wall ascends or descends sharp acclivities, the parapet is terraced into steps. At intervals there are towers, some of which, projecting beyond the wall, are a flank defence, while others rise from the parapet itself as though intended to defend the top.

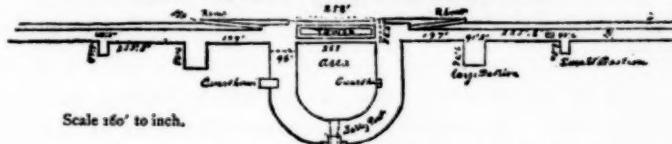
We examined the wall for about one mile on each side of the pass, making careful measurement at intervals. Its average width at top is 20 feet and at bottom 23 feet. The outer side is 24 feet in height, including 4 feet of parapet. The loop holes and small embrasures for the wall pieces alternate—fig. 1, plate 2. As far as could be discerned the wall is planned without reference to the natural features of the ground of which it takes but little advantage. To man it throughout its entire length would require upwards of ten millions of men. As a defence against invasion it has proved ineffectual, though doubtless it prevented many petty incursions or raids. Its present good condition in a climate of heat, rain and severe frost, after a lapse of more than 2,000 years, attests the skill of the builders. As a gigantic means of defence, and as a monument of absolute power, it stands without a rival. At the great passes which it crosses, it has been, and may still be useful in keeping out invaders; though the thinness of the wall would soon cause it to yield to the fire of modern field artillery.

PEKING.

Not so the walls of this ancient city, which are of a different character, and capable of sustaining a powerful artillery fire for many hours. In fact no guns but the heaviest would have much effect on them. Believing that the

dimensions of the wall had been very much exaggerated by writers who had visited the city, and by some who had not, I made the circuit of the wall accompanied by General George A. Forsyth, who went at my request to verify observations. We accomplished the distance (about 15 miles) in 5 hours, and ascertained that the wall had the mean dimensions given in the following plan (plate 3).

Plate 3. PLAN OF WALL ENCLOSING THE CITY OF PEKING.
Crenellated part of wall not shown owing to scale.

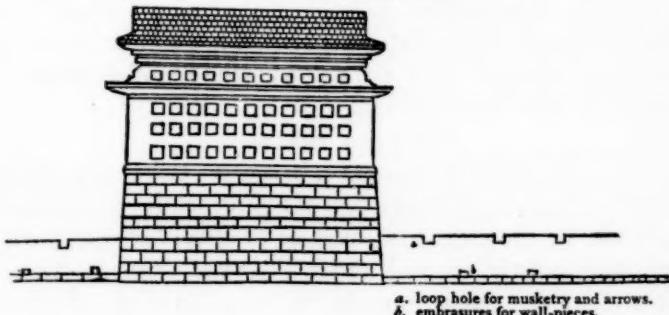


The tower "a" is shown in elevation plate 4—the drawing of which is from a photograph.

NOTE.—Although the main width of terre-plein was found to be 52 feet, the following great variations were noticed. 39' 42' 48' 6"; 62' 70' 6". The mean height of outer wall is 40' 4" with the following variations, 36' 37' 40' 8" 48'. The mean of inner wall 35' 6" with following variations, 30' 37' 8"; 38' 6". On the south side the parapet is 6' high. On the north it rises to 7' and 8" with a stone banquette at the foot of 6". On the west side the parapet is as low as 5' 6" though portions of it reach 6'.

The general form of the enclosure surrounding the Tartar city is a rectangle with the northern and eastern sides connected by the arc of a circle. There are nine gates, at each of which the wall is double and made to form a semi-circular enclosure or area, strengthened and defended by two towers (plate 4), the outer one being arranged with

Plate 4. TOWER OF WALL ENCLOSING THE CITY OF PEKING.
Drawn from a photograph.



a. loop hole for musketry and arrows.
b. embrasures for wall-pieces.

four tiers of casemated guns placed one above the other. There are similar towers at each angle, while large and small bastions placed at intervals of about 250 feet facilitate a flank fire. The embankment is of well rammed earth resting on a granite foundation. It is faced with 4 ft. of brick and paved with broad tiles laid in a bed of concrete 3 ft. thick. The wall is loop-holed for archers, and has small embrasures for the wall-pieces.

As an obstacle to assault though of no great value, is to be mentioned the canal which runs parallel with the wall of the Tartar city, from a point on the east side near the junction of the Chinese wall, to a corresponding point on the west side. No other drawings are given as they are to be found in many books of travel.

From this description and plate it will be observed that the dimensions of the walls are not uniform; that they are greatest on the north side, and least on the west, while the south and east sides are nearly uniform. It is not easy to understand the cause of this, as from the location of the city and the topography of the surrounding ground, the sides are equally exposed to attack. Probably the north side was held most exposed, owing to the position of the Nankow and Kubikow passes, on the great roads to the north and northeast leading into Mongolia, and over which passed the hosts of Genghis and Kublai-Khan—by supposing the walls to have been constructed and repaired at long intervals the variation in dimensions may be explained. The walls of Tung-chow and other places we visited are similar to those of Peking, although they are not as strong, and less care is manifest in their construction.

MODERN FORTS.

These are either of masonry, brick, or earth apparently erected with but little knowledge of the principles of engineering, either in the choice of sites or the plans of the works. They were mostly erected about the year 1840, at various points along the coast, to resist the invasion of the English,

who experienced but little difficulty in reducing or destroying them. At that time the strongest fortifications were the Bogul forts at the mouth of the Pearl, or Canton river, where they were located so as to command the channel. Although still in existence they are too slight and placed too near the water's edge to be useful against the iron clad vessels and artillery of the present day.

These forts have stone parapets with large embrasures very closely placed, and without flank fire of any kind. They are now dismantled and partly in ruins, though higher up the river near Canton an earthwork is being constructed in imitation of those at the mouths of the Pei-ho and Wo-Sung rivers.

As defending the highway from the sea to the capital, the Chinese consider the forts at the mouth of the Pei-ho of very great importance, and regard the location as of the highest strategic value; therefore they have made unusual efforts to enlarge and strengthen them. However, these forts are of but little consequence either as an obstruction in the path of an invading force, or as a point of strategic interest. Indeed, there is not a strategic point of real value between Peking and the sea, although the possession of the Pei-ho would facilitate the transportation of supplies, and Tien-tsin and Tung-chow on account of their wharves would facilitate shipments. But the Pei-ho forts would not prevent their acquisition, as the country is perfectly level for miles, and the river can be easily reached higher up, by landing some distance north of its mouth; a manœuvre which if successfully performed would cause the evacuation of the forts or the capture of the garrisons.

At its mouth the river is about 200 yards wide, and the forts are on either side. We visited the one on the west bank and fully realized the worst description we had read or heard of the Chinese artillery. The forts were gaily and profusely decorated with flags, and the garrison in two lines facing inwards formed an avenue from the shore to the fort,

the banner men with colors waving alternating with those who carried muskets. On landing we were met by Mr. Liasun, a mandarin of the household of Li-Hung-Chang, Grand Chancellor of the Empire, and Governor of the province of Chihli, by whose permission our visit was made. Taking our seats in Chinese carts we were jolted into the fort, where we were met by General Loo and his officers and saluted with three guns; the highest military compliment paid by the Chinese.

The fort is casemated, having also a few guns en-barbette and all so placed as to command the entrance of the river and fire out to sea. The land side of the fort is arranged for field guns and infantry. The parapets are of earth well rammed; the exterior slope is very steep and is made to retain this inclination by the use of ni-chuen, a compound of sifted gravel, clay, lime and water, which when properly mixed and protected from the rain for a time, is very hard, resembling stone.

The exterior slope is nearly horizontal, which is of no great consequence inasmuch as the interior crest is so high above the terre-plein, as to intercept the aim of the tallest Chinaman, and there is no banquet.

The sea-front is casemated, the casemates being of wood covered with earth, and very large and badly constructed; they would soon yield to the fire of any of our naval vessels.

The armament embraced 3—36^{c.m.} Krupp guns en-barbette, several 9-inch Dalghren guns, and a number of old 32 and 42-pounders.

The forts at the mouth of the Wo-Sung, below Shanghai, are similar to those described above.

Though not bearing directly on the subject of this paper, it may not be uninteresting to relate an interview which took place with Prince Kung, President of the Chinese Imperial Council, and of the Tsungli-Yamen or foreign office, and probably the most remarkable man in the East.

The coup d'etat by which he seized the reins of govern-

ment, and made himself the virtual ruler of four hundred millions of people, is among the most audacious and successful political achievements in the history of Asia.

Prince Kung is a brother of the late Emperor Hien-fung, who died in August 1861, leaving two Empresses (one of whom had been his concubine), and a son seven years of age. In behalf of this son the Emperor, just before his death, established a council of regency which was composed of eight members. During the invasion of China by the allies the imperial court had been at Je-ho, and when, after the death of the Emperor, it was decided to take the young Emperor back to Peking an opportunity was presented to the Prince for making himself master, and he laid and executed his plans, with the greatest boldness and most perfect self-reliance. Accompanied by a large number of his retainers he left Peking to meet his nephew, and although the council of regency attempted to prevent it, the Prince succeeded, not only in having an interview with the young Emperor, but with the two Empresses, during which, it is supposed, he arranged the coup d'état which shortly followed.

Soon after the arrival of the court in Peking, an order appeared, purporting to have been issued by the Emperor, dissolving the council, and conferring the regency on the Empress mother.

Three distinguished members of the council (one of whom was a relative of the Emperor) who ventured to question the authenticity of the order and to remonstrate, were arrested, tried, and executed, and from that day to this Prince Kung has been the actual, although not the nominal ruler of China. Accompanied by Mr. Avery, our minister, and Mr. Holcomb, the secretary of legation, who acted as interpreter, we rode to the Tsungli-Yamen, or foreign office, where we were presented to the Prince. With him were Chung-Hou, the war minister, and a third minister whose name I do not now recall.

The greeting of the Prince was quite friendly, and as soon as

we were seated, the most delicious tea, flavored with the cherry blossom was brought, and the conversation commenced. The Prince inquired how we were, when we had arrived, and how we liked Peking. These questions were answered by General Upton who also explained the object and official character of our visit. The table about which we were seated was now laid with Chinese confection of various kinds, and samshu, a liquor distilled from the rice, was served in tiny cups which were never allowed to be empty, the Prince remarking facetiously "that as we were good soldiers we were no doubt good drinkers," an opinion which we thought he must have formed by his association with the war-minister, who toasted us about every five minutes, and who emptied his cup each time. The Prince then expressed his pleasure at seeing us, and inquired to what branches of the service we belonged. In reply General Upton said that the name of the Prince had been well known in the United States for more than ten years, that he was surprised to see one apparently so young controlling the destinies of such a great nation, and ended by congratulating the Prince on the long life before him which he felt sure would be devoted to the welfare of his people.

West Point, and the admission of Chinese cadets, was then mentioned, the Prince manifesting great interest. Mr. Avery suggested that it would be a suitable time to renew an application, made some years previously, to allow a few of the Chinese youth to annually enter our military and naval schools. From this the conversation turned on our civil war and the Taiping rebellion, when the interview closed.

Prince Kung is now upwards of forty-six years of age, and is striking in appearance. He is above medium height, with the olive skin, dark hair and eyes of his race. His face is expressive of great cunning, boldness and intelligence, and his manner is authoritative but graceful and courteous. When he begins to speak he fixes his eyes on you intently,

but immediately drops them, and as he listens he squints and turns his head aside slightly.

Although surrounded by spies, and living among those whose official mendacity and treachery are proverbial, but one attempt to remove him from his high position has ever been made, and that caused such general consternation and regret that he was instantly restored to his place. Notwithstanding his Manchu descent, he is thoroughly Chinese in his habits and feelings, which no doubt accounts in a great measure for his immense popularity with the people.

PERSIA.

The artillery of Persia constitutes three separate commands, viz. : the troops ; the arsenals and depots ; the stables.

A general officer residing in Teheran commands the artillery troops, and is chief of artillery. He has a staff, the chief of which is also a general with the title of Bochi, or chief.

It is the duty of the commandant of artillery to call out the troops and relieve them, and to have the supervision of their pay, clothing, and garrison service. He makes such recommendations to the war-minister as he may think advisable in reference to the appointment and promotion of officers, and determines the artillery troops of the different garrisons, each of which is composed of one battalion, or detachments from several, as the war-minister, or chief of artillery may order.

THE TROOPS.

These form twenty battalions, each of 250 officers and men. The battalion consists of two companies, and has the following officers : 1 colonel ; 2 majors ; 2 captains ; 2 lieutenants ; 2 sub-lieutenants ; total, 9 officers.

This, the theoretical organization, is not followed however, and each battalion is officered according to circumstances, and no two are alike.

There are no organized batteries or companies, and no

train. Whenever guns are required they are taken from one of the depots, and the necessary officers, men and horses designated to accompany them.

As a rule each battalion should be in service for one year, and on leave the next, but sometimes they remain for two years and in return have a leave for two years. But this is a distinction without difference, for whether nominally with the colors or on leave, there is but little duty and no instruction, and both officers and men are occupied with their private business or are dispersed throughout the country pillaging.

The military uniform of the Persians consists of a shako or cap, a dark blue tunic, and trousers of a reddish brown color, all of French pattern.

Nothing could exceed the clumsy and grotesque appearance of the Shah's palace guard in this dress, which was worn without regard to fit, neatness, or soldierly-bearing. The small arms are of European manufacture though of old pattern and thoroughly neglected. The native dress is of dark blue cloth, the coat being long with full skirts gathered in plaits at the waist, where it is secured by a girdle or belt, the trousers are loose and of full length. On the whole the dress is not prepossessing except when the wearer is mounted, it then gives rather a graceful appearance. In the care and use of their private weapons the Persians, and indeed all Asiatics, take the greatest pride. They are often of the best materials and of costly make, and every man who can afford it goes "armed to the teeth," which is necessary on account of the unprotected and desolate nature of the country and the great number of marauders.

INSTRUCTION.

Except at Teheran the artillery is without instruction. For many years before the Anglo-Persian war of 1856, the artillery was instructed by English artillery officers, and as far back as 1828 is said to have been equal to the Russian. Following the English came French and Austrian officers

in turn, who were unable to accomplish much, for want of proper encouragement and support. At present Captain Leesoe of the Belgian service is employed as instructor, and, although an energetic and capable officer, he is unable to effect any reform either in the way of organization, discipline or material. As a matter of fact then, the Persian artillery has been for years, and is now without instruction, and except the troops at Teheran, and a few old officers scattered throughout the country, the personnel is ignorant of all artillery service.

THE ARSENALS.

The arsenal at Teheran is in reality the only one in the country, though nominally another is located at Tabreez. This however is more properly but a depot of the main arsenal.

The arsenal at Teheran is under the direction of a general officer, who receives his orders from the war-minister direct. There are besides six or eight field-officers, and a number of captains and lieutenants, non-commissioned officers and workmen. The annual cost of the arsenal is 100,000 tomans (\$450,000) much of which is misapplied ; still, owing to the fears of the Shah, there is said to be more honesty in its administration than in most of the public offices. For the supply of troops at other points, there are supposed to be depots, which are branches of the arsenal at Teheran. We did not see them en-route nor hear of them till we reached the capital.

MATERIAL.

The guns are all of bronze, except a few light iron pieces mounted on camels, and called zamborees, or "little wasps."

The Persians have in service 24-pounders, said to have been captured by Nadie-Shah in India, and a few 9 and 12-pounders presented to the Shah by the Russians ; there are also a few home-made guns of different sizes, a number of 6-pounder howitzers, 60 rifled 6 and 4½-pounders on the Belgian system, which were cast and rifled in Teheran, but

which have never been tested. The Persians do not understand the working of iron, and the powder made in the government mills at Teheran, as well as that manufactured by private enterprise, is of inferior quality, and rarely two samples can be found of the same kind.

THE STABLES.

The "stables" (or supply of horses) are under a general officer who receives a yearly sum for the maintenance of all artillery horses, the number of which is determined by the war-minister. The number actually in service falls short of 1000, and not more than half of these are in the garrisons, but are scattered about wherever grass is plenty and cheap.

REMARKS.

Japan, China and Persia have felt the same influences though not in the same degree. While the position and feelings of the Japanese have been favorable to foreign intercourse, the vast geographical extent of China, its numerous population, and the great diversity of dialects, have made such intercourse difficult, aside from the intense aversion of the government and people to foreigners, while the barren and somewhat inaccessible location of Persia, infested by roving bands of robbers, and without roads and suitable means of communication and travel, have almost closed that country to the rest of the world.

Twenty-five years ago the people of Japan were without a single modern contrivance for helping manual labor; within this period they have come to adopt a great number. They have revised their laws, and mitigated the severity of legal punishments; they have perceived the importance of rapid communication, and their railroads, telegraph and postal service are as well conducted as those of Europe or America, while the civil and military schools are fast attaining the perfection of their foreign models.

In the arsenals and workshops of the artillery some of the costliest and best machines are to be found, and the

Japanese workmen use them with the manual skill for which they are world-renowned.

Their artillery officers have recently commenced scientific experiments for the purpose of comparing breech and muzzle-loading guns, and it is reasonable to suppose that they will reach correct conclusions. In fact, judging from the past, it would not be difficult to foretell with some degree of accuracy the probable future of the Japanese.

With their intrinsic merit, their clever tact in choosing and retaining friends they must progress, and at no distant day the traveller to Japan may expect to find, not only a well administered and highly trained artillery, but a fine army.

General Upton has so clearly stated in his report the main causes of Chinese inferiority in military matters, that but little need be said on that point. Other eminent travellers and historians have explained the peculiarities of their government and institutions. Some of these accounts, although written long ago, are as true now as then, and the visitor to China after the lapse of many years finds no change save in those cities under the jurisdiction of foreigners, and even there the Chinese remain as they were. Every attempt to remodel the army and introduce reforms in the public service has failed, and unless forced to go on by some great event, the Chinese of the 20th century will differ in no essential respect from their ancestors of the present day.

This I think may be attributed in part to the conservatism of the government, which has good reason to fear the introduction of more liberal methods, and in part to the peculiar qualities which centuries of conservatism have developed in the people, and which seem to have deprived them of the inclination or power to assimilate with other nations.

Although scattered from one end of the earth to the other they preserve in an astonishing degree the dress, habits and customs of their own country. No matter to what persecution it may subject him, or by what influences he may be surrounded, a Chinaman is always Chinese, and this char-

acteristic, which seems to be a national trait, is no doubt fostered with the greatest care by the government, and finds expression in their own country in a stubborn resistance to emigration, and immigration, and the civilization of the new world. On the Pei-ho river at Tien-tsin we met a Chinese mandarin who was educated at Hamilton College, N. Y., who had lived for thirty-five years in this country, and who then had two sons at an American college. In reply to a question, as to what had induced him to return to China after thirty-five years residence in a free country, he said : "that from the day he left home until he returned he had "never known happiness ; that he had always been haunted "by an irresistible desire to go back, to which he had finally "yielded, and he expected that his children would have "the same feelings and that they too would return to "China." This man was liberally educated, had travelled in Europe, and spoke the English language with an accent as pure as that of any American or Englishman, and yet he had abandoned every vestige of the life he had lived abroad, had resumed his chop sticks and queue, and in outward appearance was as strictly Chinese as though he had never left the country. There is something more than mere conservatism in this. The mental tyranny which compels an intelligent man to dwell amidst the squalor, the poverty and the misery of such a hell as Tien-tsin after thirty-five years residence in any city of Europe or America, is a feeling which cannot be measured by ordinary processes, and which deserves to be carefully analyzed by those who wish to understand Chinese character. It shows how impervious even the most intelligent Chinese may be to outside influences, and how quickly they resume their old ways of life as soon as those influences are removed. A people thus wedded to old traditions and customs, and whose isolation and peaceful occupations have rendered them oblivious to military pursuits, cannot be expected to make much progress in military science ; nor do they. The low character of the military examinations

of the Chinese,* which we witnessed in Canton, are a curious illustration of the respect paid to old customs, even after they have become injurious to the welfare of the state, and are a perfect exemplification of the disesteem in which the military profession is held. Although education is general throughout the country, and the highest respect is paid to the learned, no literary attainments are required of an officer, whose abilities as a soldier are measured by the size and strength of his body, rather than by the qualities of his mind and heart. This is an anomaly, even in China where all officials must qualify by undergoing the most rigid competitive educational tests—and cannot be explained, any more than the recent freak of purchasing and destroying the only rail-road in the country, except on the ground of reluctance, indifference, or positive dislike.

The military future of Persia is perhaps not quite so doubtful as that of China, as from recent accounts† it appears that the Shah has determined to make one more effort to improve the character of his army.

The political position of Persia at this time is such as to compel the Shah to do this or incur risks which may prove fatal to his dynasty, if not to the independence of the country. A horseback ride from the Persian gulf to the frontiers of Russia, a reasonable official sojourn in the cities of Bushire, Shiraz, Ispehan and Tabreez, and a month's residence at the capital Teheran, will afford ample proof of this.

The mean elevation of Persia above sea-level is about 6,000 feet, which, in combination with other physical causes, occasions climatic effects which have converted a large part of the country into a dessert, and rendered agriculture most

* See Gen. Upton's "Armies of Asia and Europe."

† A gentleman residing in Teheran has recently written that 1 artillery officer, 1 engineer and 11 infantry officers of the Austrian army have arrived for the purpose of organizing a body to act as a model for the Persian army; that the police of the city has been reformed, electric lights introduced into the palace, and gas in the streets; that a good road has been constructed to Tabreez and one promised to Bushire, and that the Shah has really taken a step toward modern civilization.

difficult. With but three or four exceptions, there is not even a grove of trees between Bushire and the Elbruz mountains, and owing to the scarcity of water the cultivation of the soil is carried on almost entirely by artificial means, water being conducted by surface or underground canals or ditches called *connauts*, from one mile to one hundred miles in length.

Whenever the supply fails, or there is in any one section of country an extraordinary rain-fall, as has been the case during the past year, the most dreadful famine prevails, in some instances depopulating entire villages. The sad impression made on our party by the sight of some of these deserted ruins is not easily effaced. Every vestige of life gone, swept away by the horrible famine of 1871-72, when nearly one-fifth of the people died of starvation; when mothers fed upon their babes, husbands on their wives, and the dead rotted in the streets for lack of burial.

These things, in connection with other disadvantages, render an increase of population beyond present numbers very problematical. The neighbors of the Shah have, therefore, but little to fear from him or his scanty and impoverished people, while *he* lives in constant dread of the political necessities of Russia and England, and of the eventual dominion of the Turks, whom he believes will yet be driven from Europe to the valley of the Euphrates, and who will then over-run his country. In fact the position of the Shah is by no means to be envied—and recent events have probably warned him that if he wishes to preserve the autonomy of the state, he must at least improve the efficiency of the military establishment. This, it seems, he has decided to do, and if Persia should be drawn into the Asiatic war which now threatens her boundaries, the contemplated reforms may prove more durable than any heretofore attempted, and Persia may possibly gain some distinction as a military power.

ANNUAL REPORT OF THE EXECUTIVE COUNCIL FOR 1879.

IN submitting a report of the condition of "The Military Service Institution of the United States," and its operations for the year ending December 31, 1879, the President and Chairman, *ex officio*, of the Executive Council, congratulates the members of the Institution upon its encouraging progress thus far. In most respects it has surpassed the expectations of its warmest friends.

The Treasurer's Report (A) shows the receipts for the fiscal year to be \$2,377.75; the disbursements, \$1,782.18; leaving \$595.57* on hand.

MEMBERS.

The increase in membership has been gradual, but encouraging. Since October, 1878, five hundred and sixty-one officers of the army have joined. A list of these is appended (B).

PAPERS.

Papers upon a variety of professional topics have been received from members as follows:

AUTHORS.	TITLES.	DISPOSITION.
ABBOT, H. L., Gen....	{ "The School of Submarine Mining at Willett's Point, N. Y. H."	....Read and published.
ALLEN, C. J., Maj.....	"Marshal Suarrow."	.....Reserved.
CHESTER, J., Capt.....	"Pointing Sea Coast Guns."	.....Read and reserved.
CRITTENDEN, T. L., Gen.....	"Marches."	.....Read and published.
FRY, J. B., Gen....	"Origin and progress of the M. S. I. U. S."	...Read and published.
HAYNIE, J. H., Capt.....	"General Skobeleff,"	.....Reserved.
LIEBER, G. N., Col....	{ "Remarks on the Articles of War and the Common Law Military."	....Read and published.
MERRITT, W., Gen....	{ "Cavalry: its organization and armament."	.....Published.
MICHIE, P. S., Prof....	{ "Education in its relation to the Military Profession."	....Read and published.
POWELL, W. H., Maj....	{ "The causes of Desertion in the Army, and the remedies therefor."	.....Reserved.
SANGER, J. P., Maj.....	{ "Artillery in the East, with some account of the fortifications of Japan and China."	....Read and published.
SCHOFIELD, J. M., Gen.....	"Inaugural Address."	.....Read and published.
SHERMAN, W. T., Gen.....	"Military Law."	.....Published.
TOTTEN, C. A. L., Lieut...	{ "Strategos—the American Game of War."	...Read and published.
VON HERRMAN, C. J., Maj..	"The Franco-Prussian War 1870-71."	.....Reserved.

PRIZE ESSAYS.

The Council has decided to offer an annual prize of a certificate of life membership and a gold medal of suitable value for the best essay on

* Balance remaining on hand Feb. 20, 1880, \$830.

a topic of current military interest. The conditions of the competition are appended (C).

The subject selected for the prize essay of 1880 is "*Our Indian Question*," and the Honorable GEORGE W. MCCRARY (late Secretary of War), one of the Judges of the United States Supreme Court, General JOSEPH E. JOHNSTON, House of Representatives, and General ALFRED H. TERRY, United States Army, have been requested to act as judges and to award the prize.

THE JOURNAL.

The first number of the Journal of Transactions has been published, and the second number is ready for the printer, and will contain this report. An arrangement has been made to print the Journal under the immediate supervision of the Publication Committee, preserving the general style and quality of material of the first number. The Journal has been entered at the New York Post Office as a quarterly magazine, and is sent through the mails at second-class rates (2c. per pound).

LIBRARY AND MUSEUM.

Considerable accessions have been made to the Library and Museum ; they comprise rare and valuable books, specimens of arms, and curious war relics—foreign and domestic. A list of these is appended (D).

BY-LAWS.

The By-Laws of the Institution require revision in phraseology and in construction ; cases have arisen in the experience of the Council for which there seems no provision. The proper committee has been instructed to prepare a revision of the Code, making such modifications and additions as seem desirable, for the action of the Institution, as provided by the present system, and necessary to effect a change. A copy of the proposed code will be sent herewith to each member who should promptly furnish the Secretary with his approval or disapproval in writing.

CORRESPONDING MEMBERS OF COUNCIL.

The Council desires to secure the aid of members at a distance from New York, who are willing to act as Corresponding Members of Council, and to exert themselves to increase the membership and encourage contributions of professional papers, and of suitable articles to the Library and Museum. At each military station there might be at least one such active correspondent. Correspondence is also solicited from members who may be visiting in foreign countries.

CONCLUSION.

The Departments of State, War, and Interior deserve the thanks of the Institution for important aid and encouragement extended during the past year.

WINFIELD S. HANCOCK,
President.

[A.]

TREASURER'S STATEMENT OF FUNDS, MILITARY SERVICE INSTITUTION OF THE UNITED STATES, JANUARY 1, 1880.

Amount of money received,	.	.	.	.	.	\$2,377 75
" " expended,	.	.	.	.	.	1,782 18
Balance on hand,						\$595 57

GOVERNOR'S ISLAND, N. Y. H.,
*Jan. 1, 1880.*N. W. BROWN,
Treasurer.

LIST OF OFFICERS WHOSE TERMS EXPIRE JANUARY, 1881.

President.¹

Major-General WINFIELD S. HANCOCK, United States Army.

Vice-Presidents.

Brevet Major-General GEO. W. GETTY, Colonel 3d Artillery.
Brevet Major-General DAVID S. STANLEY, Colonel 22d Infantry.
Brevet Major-General Z. B. TOWER, Colonel Corps of Engineers.
Brevet Major-General JAMES B. FRY, Colonel Adj't-General's Dept.
Brevet Major-General WESLEY MERRITT, Colonel 5th Cavalry.

Corresponding Secretary.¹

Brevet Brigadier-General THEO. F. RODENBOUGH, Colonel U. S. A.

Recording Secretary.¹

Brevet Lieutenant-Colonel G. NORMAN LIEBER, Major, Judge Advo.

Treasurer.¹

Brevet Brigadier-General NATHAN W. BROWN, Colonel Pay Dept.

Vice Treasurer.¹

Brevet Major JOSEPH P. SANGER, Captain 1st Artillery.

EXECUTIVE COUNCIL.*

THE PRESIDENT AND VICE-PRESIDENTS, *ex-officio.*

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BROWN, N. W., Colonel P. D. B.-G.	LIEBER, G. N., Major, Judge-Adv. L.-C.
CRITTENDEN, T. L., Col. 17th Inf. B.-G.	NEILL, T. H., Colonel 8th Cavalry. B.-G.
CUYLER, J. M., Colonel M. D. B.-G.	PERRY, A. J., Lieut.-Col. Q. M. D. B.-G.
DAVIS, N. H., Colonel I. G. D. B.-G.	RODENBOUGH, T. F., Col. U. S. A. B.-G.
SANGER, J. P., Captain 1st Artillery. Maj.	

Publication Committee.

Generals CRITTENDEN, TOWER, FRY, DAVIS, and Major SANGER.

¹ Governor's Island, New York Harbor.

² West Point, New York.

* There are three vacancies in the Council.

[B.]
LIST OF MEMBERS

(555)

WHO JOINED THE INSTITUTION BETWEEN SEPTEMBER 28, 1878,
AND MARCH 1, 1880.

[*Brevets* are designated by initial letters or abbreviations immediately following regiment or corps.]

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(5).

The Hon. RUTHERFORD B. HAYES,	President of the United States.
The Hon. GEORGE W. McCRARY,	(late Secretary of War.)
The Hon. ALEXANDER RAMSEY,	Secretary of War.
*General WILLIAM T. SHERMAN,	United States Army.
Lieutenant-General PHILIP H. SHERIDAN,	United States Army.

Life.

(10).

BREWERTON, HENRY F.	Captain 5th Artillery.
FLOYD-JONES, DE LANCEY	Colonel U. S. A.
GOLDMAN, HENRY J.	Second Lieutenant 5th Cavalry.
MORRIS, ARTHUR	Captain 4th Artillery.
NICKERSON, A. H.	Major A. G. Dept.
RICE, EDMUND	First Lieutenant 5th Infantry. Lt.-C.
SANNO, JAMES M. J.	Captain 7th Infantry.
SAWYER, J. ESTCOURT	First Lieutenant 5th Artillery.
SLAKER, ADAM	Second Lieutenant 1st Artillery.
TURTLE, THOMAS	First Lieutenant Engineers.

Annual Subscribers.

(540)

ABBOT, F. V., 2d Lt. Eng.	ARTHUR, W., Maj. Pay Dept.
ABBOT, H. L., Lt.-C. Eng. B.-G.	AUDENRIED, J. C., Col. A. D. C.
ADAMS, G., 2d Lt. 5th Arty.	AUGUR, C. C., Brig.-Gen. M.-G.
ADAMS, T. R., 1st Lt. 5th Arty.	AYRES, R. B., Col. ad Arty. M.-G.
ALDEN, C. H., Maj. M. Dept. Lt.-C.	BABBITT, L. S., Capt. Ord. Dept.
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ALLEN, C. J., Capt. Eng. Maj.	BAILY, C. M., 1st Lt. 8th Inf.
ALLIGOOD, C. A., Capt. M. S. K.	BAILEY, H. K., 2d Lt. 5th Inf.
ALVORD, B., Paymaster-General.	BAILEY, H. L., 2d Lt. 21st Inf.
AMES, R. F., 2d Lt. 8th Inf.	BAILEY, T. N., 1st Lt. Eng.
ANDERSON, G. S., 1st Lt. 6th Cav.	BAIRD, W., 2d Lt. 6th Cav.
ANDERSON, T. M., Lt.-Col. 9th Inf.	BALDWIN, J. M., 2d Lt. 5th Arty.
ANDREWS, GEORGE, 2d Lt. 25th Inf.	BALL, E., Major 7th Cav.
ANDREWS, G. L., Prof. U. S. M. A.	BARBER, T. H., 1st Lt. 1st Arty.
ANDREWS, G. L., Col. 25th Inf.	BARLOW, J. W., Maj. Eng. Lt.-C.
ANDRUSS, E. VAN A., 1st Lt. 1st Arty. Capt.	BARNARD, J. G., Col. Eng. M.-G.
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ARNOLD, R., Maj. 5th Arty. M.-G.	

* See list of Annual Subscribers.

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 BATES, A. E., Maj. Pay Dept.
 BATES, K., Capt. 1st Inf. Maj.
 BAYLOR, T. G., Lt.-C. O. D. Col.
 BEACH, W. C., Capt. 11th Inf.
 BENÉT, S. V., B.-G. Chief Ordnance.
 BENHAM, H. W., Col. Eng. M.-G.
 BENJAMIN, S. N., Maj. A. A. G. Lt.-C.
 BENTZONI, C., Capt. 25th Inf. Lt.-C.
 BERGLAND, E., 1st Lt. Eng.
 BERNARD, R. F., Capt. 1st Cav. Col.
 BEST, C. L. JR., 1st Lt. 1st Arty.
 BINGHAM, J. D., Lt.-Col. Q.M. Dept. B.-G.
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 BLAIR, F. P., 2d Lt. 3d Arty.
 BLAKE, G. A. H., Col. U. S. A. B.-G.
 BLISS, Z. R., Lt.-C. 19th Inf.
 BLOCKSM, A. P., 2d Lt. 6th Cav.
 BLUNT, C. E., Lt.-C. Eng. Col.
 BLUNT, S. E., 1st Lt. Ord. Dept.
 BOMFORD, J. V., Col. U. S. A. B.-G.
 BOWEN, W. H. C., 2d Lt. 5th Inf.
 BRADEN, C., 1st Lt. 7th Cav.
 BRADFORD, J. H., Capt. 19th Inf.
 BRANNAN, J. M., Lt. C. 1st Arty. M.-G.
 BRECK, S., Maj. and A. A. G. B.-G.
¹BREWERTON, H., Col. U. S. A. B.-G.
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 CAMPBELL, J. B., Capt. 4th Arty. Maj.
 CAREY, A. B., Maj. Pay Dept. Lt.-Col.
 CARPENTER, L. H., Capt. 10th Cav. Col.
 CARLTON, C. H., Maj. 3d Cav.

 CASEY, S., Col. U. S. A. M.-G.
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 CHAMBERS, A., Lt.-Col. 21st Inf. Col.
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 CHASE, C., 1st Lt. 3d Arty.
 CHESTER, J., 1st Lt. 3d Arty. Capt.
 CHILSON, G. W., Capt. 8th Cav.
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 DAVIS, N. H., Col. I. G. Dept. B.-G.
 DAVIS, W. B., Asst. Surg. M. D.
 DAWES, W. J., Capt. U. S. A.

¹ Deceased.

- DAY, H., Col. U. S. A. B.-G.
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 DODGE, T. A., Capt. U. S. A. Lt.-C.
 DOUBLEDAY, A., Col. U. S. A., M.-G.
 DOUGHERTY, J. J., 2d Lt. 11th Inf.
 DOWD, H., 2d Lt. 3d Arty.
 DRUM, W. F., Capt. 2d Inf. Lt.-Col.
 DU BARRY, B., Maj. S. D. Col.
¹DU BOIS, J. V., Maj. U. S. A.
 DUDLEY, E. S., 1st Lt. 2d Arty.
 DUNN, W. McK., Judge-Adv. Gen.

 EAKIN, C. P., Capt. 1st Arty. Maj.
 ECKERSON, T. H., 2d Lt. 19th Inf.
 ECKERSON, T. J., Capt. Q. M. Dept. Maj.
 ELDER, S. S., Capt. 1st Arty. Lt.-C.
 ELDERKIN, W. A., Capt. S. D. Maj.
 ELLIOT, G. H., Maj. Eng.
 EVANS, G. H., 2d Lt. 10th Cav.
 EWERS, E. P., Capt. 5th Inf.

 FARLEY, J. P., Maj. Ord. Dept.
 FARQUHAR, F. M., Maj. Eng. Lt.-C.
 FEBIGER, G. L., Lt.-C. P. D.
 FISK, W. L., 2d Lt. Eng.
 FITCH, W. G., 1st Lt. U. S. A.
 FLETCHER, J. S. JR., Capt. 16th Inf. Lt.-C.
 FLINT, F. P., Col. 4th Inf.
 FORBES, T. F., 1st Lt. 5th Inf.
 FORSYTH, G. A., L. C., A. D. C. B.-G.
 FORSYTH, J., D.D., LL.D., Chap. U. S. M. A.
 FORSYTH, J. W., Lt.-C. 1st Cav. B.-G.
 FOSTER, C. W., Capt. Q. M. Dept. Col.
 FOSTER, J. E. H., 2d Lt. 3d Cav.
 FRANK, R. T., Capt. 1st Arty. Lt.-C.
 FREUDENBERG, C. G., Lt.-C. U. S. A.
 FRY, J. B., Col. A.-G. Dept. M.-G.

 GALBRAITH, W. W., 2d Lt. 5th Arty.
 GARDNER, A. B., Maj. J. A. Dept.
 GARRARD, J., 1st Lt. 4th Arty.
 GARST, C. E., 2d Lt. 15th Inf.
 GAYLE, E. C., 2d Lt. 2d Arty.

 GENTRY, W. T., Maj. 9th Inf. Lt.-C.
 GETTY, G. W., Col. 3d Arty. M.-G.
 GETTY, R. N., 2d Lt. 22d Inf.
 GIBSON, F. M., Capt. 7th Cav.
 GIBSON, G., Lt.-Col. 3d Inf.
 GIBSON, H. G., Maj. 3d Arty. Col.
 GILLESPIE, G. L., Maj. Eng. Lt.-C.
 GILLMORE, Q. A., Lt.-Col. Eng. M.-G.
 GIRARD, A. C., Asst. Surg. U. S. A.
 GITTINGS, E., Capt. 3d Arty. Maj.
 GLENN, G. E., Maj. Pay. Dept.
 GODFREY, E. S., Capt. 7th Cav.
 GOODLOE, A. H., Capt. 22d Inf.
 GORDON, C. G., 1st Lt. 6th Cav.
 GORDON, D. S., Maj. 2d Cav.
 GOULD, W. P., Maj. Pay. Dep.
 GRAHAM, L. P., Col. U. S. A. B.-G.
 GRAHAM, W. M., Maj. 4th Arty. B.-G.
 GRAVES, W. P., Capt. 2nd Arty. Maj.
 GREEN, J., Maj. 1st Cav. Lt.-C.
 GREENE, C. T., Capt. U. S. A. Maj.
 GREENE, O. D., Maj. A.-G. Dept. B.-G.
 GREENLEAF, C. R., Maj. M. D.
 GREGG, J. I., Col. U. S. A. B.-G.
 GREGORY, J. F., Capt. Eng.
 GRIER, W. N., Col. U. S. A. B.-G.
 GRIFFIN, E., 1st Lt. Eng.
 GRIFFITH, D. A. 1st Lt. 3d Inf.
 GUENTHER, F. L., Capt. 5th Arty. Col.
 GUTHRIE, J. B., 1st Lt. 13th Inf.

 HAGNER, P. V., Col. Ord. B.-G.
 HALE, J., 1st Lt. and Adj. 3d Inf.
 HALL, R. H., Capt. 10th Inf. Lt.-C.
 HALL, W. R., Asst. Surg. M. Dept.
 HALLECK, W. F., 1st Lt. U. S. A.
 HAMILTON, F. B., Capt. 2nd Arty.
 HAMILTON, J. M., Capt. 5th Cav.
 HAMILTON, S. T., Capt. 2nd Cav.
 HAMMOND, J. F., Lt.-C. M. Dept.
 HANCOCK, W. S., Major-Gen.
 HANDBURY, T. H., Capt. Eng.
 HANNAY, J. W., 1st Lt. 3d Inf.
 HAPPERSETT, J. C. G., Maj. M. D.
 HARDIN, M. D., B.-G. U. S. A.
 HARGOOS, C. E., 1st Lt. 5th Inf.
 HARRIS, M., Capt. 1st Cav.
 HART, V. K., Maj. 5th Cav. Lt.-C.

¹ Deceased.

LIST OF MEMBERS.

- HASBROUCK, H. C., Capt. 4th Arty. Maj.
 HASKELL, J. T., Capt. 23d Inf.
 HASKIN, W. L., Capt. 1st Arty. Maj.
 HAUGHEY, J. A., 1st Lt. 21st Inf.
 HAYES, E. M., Capt. 5th Cav.
 HEARN, J. A., Capt. U. S. A. Maj.
 HEATH, F., 1st Lt. Ord. Dept.
 HEGER, A., Maj. M. D. Lt.-C.
 HEIN, O. L., 1st Lt. 1st Cav.
 HEINTZELMAN, S. P., M.-G. U. S. A.
 HESS, F. W., 1st Lt. 3d Arty.
 HEUER, W. H., Capt. Eng.
 HEVIL, E. M., Capt. 4th Cav.
 HILLS, E. R., 1st Lt. 5th Arty.
 HINKS, E. W., Col. U. S. A. B.-G.
 HOBBS, C. W., 1st Lt. 3d Arty.
 HOFF, J. VAN R., Capt. M. D.
 HOFFMAN, W., Col. U. S. A. B.-G.
 HOGARTY, M. J., 1st Lt. U. S. A.
 HOGARTY, W. P., 2d Lt. U. S. A. 1st Lt.
 HOLABIRD, S. B., Col. and A. D. C., B.-G.
 HOLMES, C., Capt. U. S. A.
 HOLMES, S. N., 2nd Lt. 13th Inf.
 HOSKINS, J. D. C., 1st Lt. 3d Art.
 HOUGH, A. L., Maj. 22d Inf. Col.
 HOWELL, R. G., 1st Lt. 2nd Arty.
 HOYT, C. H., Capt. Q. M. Dept.
 HUBBELL, H. W., Jr., 1st Lt. 1st Arty.
 HUDSON, E. McK., Maj. U. S. A. Lt.-C.
 HUGGINS, E. L., Capt. 2d Cav.
 HUGHES, R. P., Capt. 3d Inf. Maj.
 HUNT, L. C., Lt.-C. 20th Inf. B.-G.
 HUNTER, E., Capt. 1st Cav.
 HUSTON, D. JR., Lt.-C. 6th Inf. Col.

 IRVINE, J. B., Capt. 22d Inf.
 IRVINE, R. J. C., 2d Lt. 11th Inf.
 IVES, R. A., 2nd Lt. 5th Arty.

 JACKSON, R. H., Capt. 1st Arty. B.-G.
 JANeway, J. H., Maj. M. D., Lt.-C.
 JOCELYN, S. P., Capt. 21st Inf.
 JONES, F. B., 1st Lt. 3d Inf.
 JONES, R. Lt.-Col. and A. I. Gen.
 JONES, S. R., 1st Lt. 4th Arty.
 JONES, W. A., Capt. Eng.
 JUDD, E. D., Maj. U. S. A.

 KELLEY, J. M., Capt. 10th Cav.
- KENDRICK, F. M. H., 1st Lt. 7th Inf.
 KENDRICK, H. L., Prof. U. S. M. A.
 KENT, J. F., Capt. 3d Inf. Lt.-C.
 KETCHUM, H. H., 1st Lt. and Adj. 22d Inf.
 KILPATRICK, R. L., Col. U. S. A.
 KIMBALL, J. P., Capt. M. D.
 KING, W. R., Capt. Eng. Maj.
 KING, W. S., Lt.-C. M. Dept. Col.
 KNOX, E. B., 1st Lt. U. S. A. Lt.-C.
 KOBRE, W. A. JR., 1st Lt. 3d Arty. Maj.

 LAGARDE, L. A., 1st Lt. M. D.
 LANCASTER, J. M., Capt. 3d Arty.
 LANDON, H. H., 2d Lt. 25th Inf.
 LANGDON, L. L., Maj. 2d Art. Col.
 LARNED, C. W., Prof. U. S. M. A.
 LATIMER, A. E., Maj. U. S. A.
¹LEE, A. T., Col. U. S. A.
 LEE, J. G. C., Maj. Q. M. D. Lt.-C.
 LEE, S. F., Maj. U. S. A. Lt.-C.
 LIEBER, G. N., Maj. J. A. Lt.-C.
 LISCOM, E. H., Capt. 19th Inf.
 LITCHFIELD, H. G., Capt. 2d Arty. Lt.-C.
 LONG, E., B.-G. U. S. A. M.-G.
 LONG, O. F., 2d Lt. 5th Inf.
 LOUGHBOROUGH, R. H. R., 2d Lt. 25th Inf.
 LUDLOW, W., Capt. Eng. Lt.-C.
 LYDECKER, G. J., Maj. Eng.
 LYFORD, S. C., Maj. O. D. Lt.-C.
 LYLE, D. A., 1st Lt. Ord. Dept.

 MACADAMS, J. G., Capt. 2d Cav.
 MACCONNELL, C. C., Capt. 5th Arty. Maj.
 MACFEELY, R., Com. Gen. Sub.
 MACMURRAY, J. W., 1st Lt. 1st Arty.
 MADDEN, F., 2nd Lt. U. S. A.
 MAGUIRE, E., 1st Lt. Eng.
 MAHNKEN, J. H., Capt. 8th Cav. Maj.
 MALEY, T. E., Lt.-C. U. S. A.
 MALLERY, J. C., Capt. Eng.
 MARCY, R. B., Brig. Gen. I. G. M.-G.
 MARSHALL, W. L., 1st Lt. Eng.
 MASON, J. W., Maj. 3d Cav. Lt.-C.
 McCALLUM, W. B., 1st Lt. 5th Arty.
 McCOOK, A. McD., Col. & A. D. C. M.-G.
 McDONALD, D. N., 2d Lt. 4th Cav.
 MCINTOSH, J. B., B.-G. U. S. A. M.-G.
 MCKEE, G. W., Capt. O. Dept. Maj.
 MCKEEVER, C., Lt.-C and A. A. G. B.-G.

¹ Deceased.

- MCKIBBIN, C., Capt. 15th Inf.
 MCKIBBIN, D. B., Maj. U. S. A. B.-G.
 McLAUGHLIN, N. B., Maj. 10th Cav. B.-G.
 McLoughlin, G. H., Capt. U. S. A. Maj.
 MCNEILL, E., 2d Lt. 1st Arty.
 MCPARLIN, T. A., Maj. M. Dept. B.-G.
 MEIGS, M. C., Q.-M. Gen. M.-G.
 MERCUR, J., Capt. Eng.
 MERRITT, W., Col. 5th Cav. M.-G.
 METCALFE, H., Capt. Ord. Dept.
 MICHIE, P. S., Prof. U. S. M. A. Lt.-C.
 MICHLER, F., 1st Lt. 5th Cav.
 MIDDLETON, J. V. D., Maj. M. Dept.
 MILLER, A. M., Capt. Eng.
 MILLER, C. P., 1st Lt. 4th Art.
 MILLS, S. C., 2d Lt. 12th Inf.
 MILLS, S. M., 1st Lt. 5th Arty.
 MINER, C. W., Capt. 22d Inf.
 MITCHELL, W. G., Capt. 5th Inf. Col.
 MITCHELL, W., 1st Lt. 3d Inf. Capt.
 MIZNER, J. K., Maj. 4th Cav. Lt.-C.
 MORRIS, R. L. JR., Capt. 18th Inf. Maj.
 MORROW, A. P., Maj. 9th Cav.
 MORTON, A. L., 1st Lt. 5th Arty.
 MUNSON, J. F., 1st Lt. 6th Inf.
 MURDOCK, D. H., Capt. 6th Inf.
 MYRICK, J. R., Capt. 3d Arty. Maj.
 NEILL, T. H., Col. 8th Cav. B.-G.
 NELSON, A. D., Lt.-C. U. S. A. Col.
 NEWTON, J., Col. Eng. M.-G.
 NICKERSON, J. D., 2d Lt. 17th Inf.
 NORRIS, B., Maj. M. Dept. Col.
 NORVELL, J. M., Capt. 12th Inf. Maj.
 NUGENT, R., Maj. U. S. A. Col.
 O'BEIRNE, R. F., Maj. 24th Inf. Lt.-C.
 O'BRIEN, M. E., Capt. 2d Cav.
 O'REILLY, R. M., Capt. M. Dept.
 OTIS, E. S., Col. 20th Inf.
 PAGE, J. H., Capt. 3d Inf. Maj.
 PARKER, D., Capt. 3d Inf. Maj.
 PARKHURST, C. D., 1st Lt. 5th Cav.
 PATTEN, F. J., 2d Lt. 21st Inf.
 PATTEN, G. W., Lt.-Col. U. S. A.
 PERRY, A. J., Lt.-C. Q.-M. D. B.-G.
 PESHINE, J. H. H., 2d Lt. 13th Inf.
 PHILLIPS, H. J., Capt. Med. Dept.
 PHIPPS, F. H., Capt. Ord. Dept.
 PITCHER, T. G., Col. U. S. A. B.-G.
 POOLE, D. W. C., Capt. 22nd Inf.
 POPE, B. F., Capt. Med. Dept.
 POSTLEY, C. A., 1st Lt. 3d Arty.
 POTTER, C. H., Capt. 18th Inf.
 POTTER, J. A., Maj. U. S. A. B.-G.
 POTTS, R. D., 1st Lt. 3d Arty.
 POWELL, J., Capt. U. S. A. Lt.-C.
 POWELL, J. W. JR., Capt. 6th Inf.
 POWELL, W. H., Capt. 4th Inf. Maj.
 PRATT, J., 1st Lt. 25th Inf.
 PRATT, R. H., 1st Lt. 10th Cav. Capt.
 PRATT, S., 1st Lt. 3d Arty.
 PRICE, P. M., 1st Lt. Eng.
 PULFORD, J., Lt.-C. U. S. A.
 PYNE, C. M., Capt. U. S. A.
 QUINBY, I., 1st Lt. 11th Inf.
 QUINN, J. B. Capt. Eng.
 RAMSAY, J. G., Capt. 2d Arty.
 RANDLETT, J. F., Capt. 8th Cav.
 RANDOL, A. M., Capt. 1st Arty. Col.
 RAY, P. H., 1st Lt. 8th Inf.
 REGAN, J., 1st Lt. 9th Inf.
 REILLY, H. J., 1st Lt. 5th Arty.
 REYNOLDS, C. A., Maj. Q.-M. Dept. Lt.-C.
 RICKETTS, J. B., M.-G. U. S. A.
 RITZIUS, H. P., 1st Lt. 25th Inf.
 ROBINSON, J. C., M.-G. U. S. A.
 ROCHESTER, W. B., Maj. P. Dept.
 ROCKWELL, A. F., Capt. Q.-M. Dept. Lt.-C.
 RODENBOUGH, T. F., Col. U. S. A. B.-G.
 ROEMER, P., 1st Lt. 5th Arty.
 ROESSLER, S. W., 2nd Lt. Eng.
 ROGERS, W. P., 1st Lt. 17th Inf.
 ROGERS, W. W., Capt. 9th Inf.
 ROSELL, W. T., 1st Lt. Eng.
 ROUSSEAU, D. Q., 1st Lt. 5th Inf.
 ROWAN, H., 2d Lt. 2d Arty.
 RUCKER, L. H., Capt. 9th Cav.
 RUSSELL, E. K., 1st Lt. 1st Arty.
 RUSSELL, G., Capt. 3d Cav.
 RUSSELL, G. B., Capt. 9th Inf. Maj.
 RUTHERFORD, R. G., 1st Lt. U. S. A. Capt.
 SACKET, D. B., Col. I. G. M.-G.

¹ Deceased.

LIST OF MEMBERS.

- SANBORN, W. I., 1st Lt. 25th Inf.
 SANGER, J. P., Capt. 1st Arty. Maj.
 SCHENCK, A. D., 1st Lt. 2nd Arty.
 SCHOFIELD, J. M., Major-Gen.
 SCOTT, J., 1st Lt. 4th Inf.
 SCOTT, R. N., Maj. 3d Arty. Lt.-C.
 SCOTT, W. S., 1st Lt. 25th Inf.
 SEMIG, B. G., 1st Lt. Med. Dept.
 SHALER, C., Capt. Ord. Dept.
 SHARPE, A. C., 2d Lt. 22d Inf.
 SHERIDAN, M. V., Lt.-C. A. D. C.
¹SHERMAN, T. W., M.-G. U. S. A.
 SHERMAN, W. T., Gen. U. S. A.
 SHURLY, E. R. P., 1st Lt. U. S. A. Capt.
 SIBLEY, F. W., 2d Lt. 2d Cav.
 SIMONSON, J. S., Col. U. S. A. B.-G.
 SIMPSON, J., Capt. Q.-M. Dept.
 SIMPSON, M. D. L., Col. Sub. Dept. M.-G.
 SLOCUM, H. J., 2d Lt. 7th Cav.
 SLOCUM, S. L. H., 2nd Lt. 18th Inf.
 SMITH, C. S., 1st Lt. Ord. Dept.
 SMITH, G. C., Capt. Q.-M. Dept.
 SMITH, J. H., 1st Lt. U. S. A. Capt.
 SMITH, J. M., 1st Lt. U. S. A.
 SMITH, L., Capt. 3d Arty.
 SMITH, O. M., 1st Lt. 22d Inf.
 SMITH, S., 1st Lt. 15th Inf.
 SNIFFIN, C. C., Maj. Pay. Dept.
 SNYDER, J. A., Capt. 3d Inf.
 SPRAGUE, C. J., Maj. Pay. Dept.
 STACEY, M. H., Capt. 12th Inf. Lt.-C.
 STANLEY, D. S., Col. 22d Inf. M.-G.
 STARLING, W. S., Capt. Ord. Dept.
 STERNBERG, G. M., Maj. M. D.
 STOUCHE, G. W. H., 1st Lt. 3d Inf.
 SUMMERHAYES, J. W., 1st Lt. 8th Inf. Capt.
 SUMNER, E. V., Maj. 5th Cav. Lt.-C.
 SUTHERLAND, C., Col. M. Dept.
 SWEENEY, T. W., B.-G. U. S. A.
 SWEENEY, H., Capt. 4th Cav.
¹SYKES, G., Col. 20th Inf. M.-G.
 SYMONS, T. W., 1st Lt. Eng.

 TAYLOR, A. B., Capt. U. S. A.
 TAYLOR, A. H. M., 2d Lieut. 19th Inf.
 TAYLOR, F. E., Capt. 1st Arty. Maj.
 TAYLOR, J. H., Maj. A. A. G. Col.
 TAYLOR, M. K., Capt. M. D.
 TEAR, W., 1st Lt. 25th Inf.

 TERRY, A. H., B.-G. M.-G.
 THIBAUT, F. W., 1st Lt. 6th Inf.
 THIES, F. 2d Lt. 3d Inf.
 THOM, G., Col. Eng. B.-G.
 THOMAS, E. D., 1st Lt. 5th Cav.
¹THORNBURGH, T. T., Maj. 4th Inf.
 THURSTON, G. A., 1st Lt. 3d Arty.
 TIDBALL, J. C., Maj. 2d Arty. B.-G.
 TOLMAN, T. M., Capt. 1st Inf.
 TORNEY, G. H., 1st Lt. M. D.
 TOTTON, C. A. L., 1st Lt. 4th Arty.
 TOURTELOTTE, J. E., Col. and A. D. C.
 TOWAR, A. S., Maj. Pay Dept.
 TOWER, Z. B., Col. Eng. M.-G.
 TOWN, F. L., Maj. M. D.
 TOWNSEND, A., Capt. U. S. A.
 TOWNSEND, E. D., Adj.-Gen. U. S. A.
 TOWNSEND, E. F., Lt.-C. 11th Inf.
¹TREADWELL, T. J., Lt.-Col. O. D.
 TREMAINE, W. S., Capt., M. D.
 TRUE, T. E., 1st Lt. 14th Inf.
 TURNBULL, J. G., Capt. 3d Arty. Maj.
 TURRILL, H. S., 1st Lt. M. D.
 TYLER, J., 1st Lt. U. S. A. Maj.

 UPTON, E. Lt.-C. 4th Arty. M.-G.

 VANCE, D. M., Capt. 16th Inf. Maj.
 VAN NESS, W. P., 1st Lt. 1st Arty.
 VAN REED, W. E., Capt. 5th Arty.
 VAN VLIET, S., A. Q.-M. Gen. M.-G.
 VAN VOAST, J., Lt.-C. 16th Inf.
 VIVEN, J. L., Capt. 12th Inf.
 VOGDES, A. W., 1st Lt. 5th Arty.
 VON HERRMANN C. J., Capt. 4th Inf. Maj.
 VON SCHRADER, F., 1st Lt. 12th Inf.

 WALKER, L. H., 1st Lt. 15th Inf.
 WALLACE, G. W., Lt.-C. U. S. A.
¹WALLACE, T. S., 1st Lt. 3d Inf.
 WALLACE, W. M., Capt. 6th Cav.
 WARD, F. K., 1st Lt. 1st Cav.
 WARD, G. S. L., 1st Lt. 22d Inf.
 WARD, T., Capt. 1st Arty.
 WARNER, E. R., Capt. 3d Arty. Lt.-C.
 WEAVER, E. M. Jr., 2d Lt. 2d Arty.
 WEIR, G. V., Capt. 5th Arty.
¹WEIR, W. B., 1st Lt. O. Dept.
 WEITZEL, G., Maj. Eng. M.-G.

¹ Deceased.

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| WESSELLS, H. W., Lt.-C. U. S. A. B.-G. | WILLIAMS, F., 1st Lt. U. S. A. Capt. |
| WESTON, J. F., Capt. Sub. Dept. | WILLIAMS, J. R., 2d Lt. 3d Arty. |
| WETHERILL, A. M., 1st Lt. 6th Inf. | WILLISTON, E. B., Capt. 2d Arty. Col. |
| WHARTON, J. S., Capt. 19th Inf. | WILSON, C. I., Maj. Pay Dept. |
| WHEELAN, J. N., Capt. 2d Cav. | WILSON, J. E., Capt. 2d Arty. |
| WHEELER, D. D., Capt. Q.M. D. | WOOD, A. E., 1st Lt. 4th Cav. |
| WHERRY, W. M., Capt. 6th Inf. Col. | WOOD, E. E., 1st Lt. 8th Cav. |
| WHIPPLE, C. W., 1st Lt. O. Dept. | WOOD, M. W., 1st Lt. Med. Dept. |
| WHIPPLE, S. G., Capt. 1st Cav. | WOOD, T. J., B.-G. U. S. A. M.-G. |
| WHIPPLE, W. D., L.-C. A. G. D. M.-G. | WOODBURY, T. C., 2d Lt. 16th Inf. |
| WHISTLER, G. N., 1st Lt. 5th Art. | WOODRUFF, D., Lt.-C. U. S. A. |
| WHISTLER, J. N. G., Lt.-Col. 5th Inf. Col. | WOODRUFF, T. M., 2d Lt. 5th Inf. |
| WHITE, J. C., Capt. 1st Arty. | WOODSON, A. E., Capt. 5th Cav. |
| WHITE, J. V., 2d Lt. 1st Arty. | WOODWARD, G. A., Col. U. S. A. |
| WHITNEY, F. A., 1st Lt. 8th Inf. | WORDEN, C. A., 1st Lt. 7th Inf. |
| WILDER, W. E., 2d Lt. 4th Cav. | WRIGHT, E. M., Capt. Ord. Dept. |
| WILDRICK, A. C., Capt. 3d Arty. Lt.-C. | WRIGHT, H. G., Chief Eng. M.-G. |
| WILLARD, J. H., 1st Lt. Eng. | WRIGHT, H. H., 1st Lt. 9th Cav. |
| WILLARD, J. P., Maj. P. D. Lt.-C. | |
| WILLIAMS, A., 2d Lt. 3d Inf. | YARD, J. E., Lt.-Col. 24th Inf. |

CASUALTIES.

DIED.

(10).

- BREWERTON, Colonel Henry, Brevet Brigadier-General U. S. Army, (retired), April 17, 1879, at Wilmington, Delaware.
- DU BOIS, Major John V., U. S. Army, (retired), July 31, 1879, at Hudson, N. Y.
- LEE, Colonel A. T., U. S. Army, December 29, 1879, at Rochester, N. Y.
- PHILLIPS, H. J., Assistant Surgeon U. S. Army, October 10, 1879, at New York City.
- SHERMAN, Major-General Thomas W., U. S. Army, (retired), March 16, 1879, at Newport, R. I.
- SYKES, Colonel George, 20th Infantry, Brevet Major-General U. S. Army, February 8, 1880, at Brownville, Texas.
- THORNBURGH, Major T. T., 4th Infantry, U. S. Army, September 29, 1879, killed in affair with the Indians, at Milk River, Colorado.
- TREADWELL, Lieutenant-Colonel Thomas J., Ordnance Department, U. S. Army, August 2, 1879, at Governor's Island, N. Y. H.
- WALLACE, First Lieutenant Thomas S., 3d Infantry U. S. Army, December 8, 1878. Found dead on banks of Missoula River, about eight miles from Missoula, Montana.
- WEIR, First Lieutenant William B., Ordnance Department U. S. Army, October 20th, 1879. Killed by the Indians near White River Agency, Colorado.

[C]

THE MILITARY SERVICE INSTITUTION OF THE UNITED STATES.

ANNUAL PRIZE ESSAY.

I. The following is published for the information of all concerned :

"*Resolved*—That a prize of a Gold Medal of suitable value, together with a certificate of life membership, be offered annually by 'The Military Service Institution of the United States' for the best essay on a military topic of current interest; the subject to be selected by the Executive Council and the prize awarded under the following conditions:

1. Competition to be open to all persons eligible to membership.*
2. Each competitor will send his essay in a sealed envelope to the Corresponding Secretary on or before March 1st in each year. The essay shall be signed only with the *initial letter* of the author's surname followed by a *figure* corresponding with the number of pages of MS. With the envelope containing the essay a separate sealed envelope will be sent, bearing the specified signs *only*, on the outside, and enclosing the author's name and 'signs.' This envelope to be opened in the presence of the Council after the decision of the Board of Award has been received.
3. The prize shall be awarded upon the report of a board consisting of three suitable persons chosen by the Executive Council.
4. The successful essay to be published in the Journal of the Institution, and the essay deemed next in order of merit shall receive honorable mention, be read before the Institution, and, at the discretion of the Council, be published with the consent of the writer." [Extract, Minutes Executive Council.]

II. The subject selected for the Prize Essay of 1880 (to be handed in on or before October 1, 1880) is

"OUR INDIAN QUESTION."

III. The following gentlemen chosen by the Council have consented to serve on the Board of Award :

The Hon. GEORGE W. McCRARY, late Secretary of War.

General JOSEPH E. JOHNSTON, U. S. House of Representatives.

General ALFRED H. TERRY, United States Army.

THEO. F. RODENBOUGH,
Corresponding Secretary.

GOVERNOR'S ISLAND, N. Y. H.,
March 1, 1880.

* All officers of the Army and professors at the Military Academy shall be entitled to membership without ballot upon payment of the entrance fee. [Extract from By-Laws.]

[D.]

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(Arranged alphabetically by names of Donors.)

LIBRARY.

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- ANDERSON, 1st Lieut. G. S. (6th Cavalry.) G. O. Nos. 13, 39, 40, 42, 45, 46, 47, 50, 51, 52, 53, 56, 70, 71, 73, 74, 75, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 97, 98, 99, 100, 102, 103, 104, 105, III. Head-Quarters of the Army, A. G. O., series of 1861.
- ALVORD, B. Paymaster-General. Reports on the Annuity Scheme; Annual Report of Paymaster-General for 1879; Sketch of Organization of Pay Dept. from 1775 to 1876. (3 pamphlets.)
- ANDRUSS, Capt. E. V. A. Congressional Globe, 1861, '62, '63: Order Book, 7th La. Inf., C. S. A., 1862-63. (8 vols.)
- ARNOLD, Gen. R. Essays on the Art of War; Journal and Correspondence of Gen. Sir H. Calvert; The Great Industries of the United States; Remarks on the Modern Fortification; Secret Strategical Instructions of Frederick II; Military, Historical and Explanatory Dictionary; Military Discipline, or The Young Artilleryman; Directions for Battalion Guns (Manuscript Tactics); *Aehani Tactica*, &c.; Memorial de Cormonlamque; Darcon on Fortifications. (14 vols.)
- BACKUS, Gen. S. W. (A.-G. of Cal.) Biennial Report of A.-G. of Cal.; Provisions of the Code relative to Militia of Cal. (2 vols.)
- BARNES, Surgeon-General; U. S. A. Medical and Surgical History of the War of the Rebellion, parts I and II; Catalogue Army Medical Museum, Circulars I, 2, 3, 4, 8, 9; Medical Department at Centennial, 1876; Railway Transportation of Wounded in Time of War. (10 vols., 4 pamphlets.)
- BARNEY, Gen. C. H. Adjutant General's Reports, (Rhode Island,) 1866, '74, '75, '76, '77, '78; Military Reports, 1879, comprising reports of A. G., Q. M. G., J. A. S. G.; Q. M. G. Reports, 1873, '74, '75, '76, '77, '78; Discipline and Drill of the Militia (Arnold.) New Militia Law of 1879, and General Orders, 1879. (3 vols. and 15 pamphlets.)
- BARR, Major T. F., Instructions for Courts-Martial and Judge-Advocates.
- BARRIGER, Gen. J. W. History of the Subsistence Department of the U. S. Army. (2 vols.)
- BAXTER, J. H. (Chief Medical Purveyor.) Medical Statistics of Provost-Marshall General's Bureau. (2 vols.)
- BELL, Hon. A. Asst. Secy. Dept. Interior. Documents (bound) of the 40th, 41st, 42d, 43d, 44th, and 45th Congress. U. S. Official Register, 1875-77 and vol. I, 1879. (432 vols.)
- BENÉT, S. V. Chief of Ordnance. Reports of experiments on Metals for Cannon (Rodman); do. do. (by a Board): Reports of Chief of Ordnance, 1868, '69, '70, '71, '72, '73, '75, '76, '77, '78, '79; Ordnance Mem., 2, 4, 5, 7, 8, 9, 10, 12, 13, 14, 17, 18, 19, 20, 21, 22, 23; Historical Statement of Rise and Progress of the Ordnance Department; Ordnance Property Regulations, 1877; Artillery for Land Service; Purchase of Arms; Ordnance Manual; Small Arms; Price List of Ordnance Stores; Organization of Ordnance Department; Rules for Inspection of Revolvers and Gatling Guns; Rules for Management of Spencer Rifles and Revolvers; Gatling Guns; Ordnance Notes, Nos. 118, 119, 120, and 121, (25 vols., 23 pamphlets.)
- BENJAMIN, Col. S. N. War Dept. General Orders, 1878; Army Register, 1878-79. (2 vols.)

- BREWERTON, Capt. H. F. Notes on Explosives and their Application in Torpedo Warfare (Hill); *Gebrauch der Artillerie* (Taubert.) (2 vols.)
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- NOYES, Major H. E. *Confederate publications as follows: Instruction for Field Artillery (Stark; G. O., Adjt. and Instr. Gen. Office, C. S. A., 1862, 1863 (with notes) 1864; Regulations Subsistence Department, C. S. A., 1861. Hardee's Tactics (Mobile); Correspondence relative to Reserved Militia of Georgia; Speech on Monroe Doctrine by De Jarnette, C. H. R.; Digest Comptroller's Decisions (Richmond), 1863; Speech on employing Negro Troops.—Golson, C. H. R.; Proclamation—General T. W. Sherman to People of East Florida, 1862; Handbill—*

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- (Note.—These Reports are printed and bound for the uses of the War Department. They are not "publications," and are yet subject to revision—additions and rearrangement. Sent for safe-keeping to the Military Service Institution Governor's Island, N. Y. H., by order of the Secretary of War : (Signed.) ROBERT N. SCOTT, Major, U. S. A.)
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- RODENBOUGH, Gen. T. F. Rebel War Clerk's Diary; Annals of 6th Penn. Cavalry; Annals of a Fortress; History of Waterloo Campaign; Memoirs of General Bartlett; Dragoon Campaigns; 2d Massachusetts Infantry and Stonewall Jackson; Bibliotheca Americana; The United Service Quarterly (Nos. 1, 2, 3,); New York, 7th Regiment; Campaigns of a Non-Combatant; Outlines of Military Division Missouri; Army Registers, 1844, 49, 53, 57, '64, '66, '67, '68, '74, '77; G. O., Volunteer Force, 1861-63; Atlantic Monthly; Colburn's United Service Magazine; Nineteenth Century; Blackwood's Magazine; G. O., Volunteer Force, 1864; G. O., War Dept., January to December, 1866; do, do, 1867; G. O., Dept. East, 1866, '67, '68; Gen. C. M. O., A. G. O., 1867-8; New York State Cabinet of Natural History, 1850; Display of U. S. Government at the Great Exhibition, 1876; Topographical chart of the Valley of Wyoming as it appeared at the time of the Indian Massacre, 1778. National Guardsman (complete); Field Glass (3 Nos.); Waterloo Atlas containing 11 topog. eng., showing Fr. and Br. positions at various times during the battle. Maps of battles of Cedar Creek, Fredericksburg, Fisher's Hill, Waynesboro. Atlantic, Harper's, Scribner's, N. A. Review, Army of Potomac, Littell's Living Age. Legislative Manual (N. Y., 1880.) (55 vols., 15 pamphlets, 16 maps.)
- RUCKER, Lieut. L. H. System of Infantry Discipline. (1 vol.)
- RUCKER, Capt. L. H. (9th Cavalry.) Tributes of the Nations to Abraham Lincoln.
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- STEVENS, J. A. Esq. Magazine of American History (monthly.) (5 parts.)
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- TOWNSEND, Gen. E. D. United States Military Laws, 1776-1863; Official Register of Volunteer Forces, 1861-65; Maneuvres of Artillery, 1826; Army Regulations, 1857; Field Artillery Tactics, 1864; United States Cavalry Tactics, 1841, 1872; Instruction of Field Artillery, 1860; Rifles and Rifle Practice, 1859; Infantry Tactics, 1825, '26, '55, 61, '62, '67; Upton's Infantry, Artillery, and Cavalry Tactics; Heavy

- Artillery Tactics, 1862; Evolutions of Field Artillery; Roberts' Handbook of Artillery; Instruction for Horse and Foot Artillery, 1839; Manual for Heavy Artillery; United States Cavalry Tactics, 1841, 1872; Sword Exercise (Rourke and Wayne); McClellan's Bayonet Exercise; Army Officer's Pocket Companion; School of Cavalry 1824: Hints on Medical Examination of Recruits; Report of Military Commission to Europe, 1854-56; General Orders, A. G. O., for 1879; Proceedings of Board of Officers in the case of Fitz-John Porter, Parts I, II, III.; The Armies of Asia and Europe; Army Register, 1880. (43 vols.)
- TOWNSEND, Gen. F. (Adjt.-Gen. S. N. Y.) Military Code, S. N. Y., (Amended); General Regulations for the Military Forces, S. N. Y., (Amended); Annual Reports of the Adjutant-General, S. N. Y., for 1868, '69, '73, '75, '78, '79. G. O., S. N. Y., 1878, '79, '80. (10 vols.)
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- WARNER, Col. E. R. G. O., War Dept. (incomplete), 1874, '75, '76; do. do. (complete) for 1877, '78; Outline Description of Posts, M. D. A.; Report of Secretary of War, 1868-'69; Report U. S. L. H. Board, 1872; Hotel Guide to London; Laws of G. C. U. S. I. O. Red Men; Constitution Army and Navy Club; Burnside's Army Bill, 1878-'79. (6 vols., 35 pamphlets.)
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- MAPS, CHARTS and PLANS included in above contributions in detail as follows: (total 155.) Military Maps illustrating operations in the United States 1861-66, *Battle Fields* (43) of Appomattox C. H., Antietam, Atlanta, Belmont, Bermuda Hundred, Big Black River Bridge, Bull Run, Carnifex Ferry, Chancellorsville, Chattanooga Cold Harbor, Cumberland Gap, Drainsville, Franklin, Fredericksburg, Gettysburg (3 sheets), Harpers Ferry, High Bridge and Farmville, Iuka, Jettersville and Sailors Creek, Knoxville, Logan's Cross-roads, Miliken's Bend and Jackson, Nashville, North Anna, Petersburg and Five Forks, Perryville, Pea Ridge, Port Hudson, Richmond, Roanoke Island, Shiloh (near Pittsburg Landing), South Mountain, Spottsylvania C. H., Tolopotomoy, Vicksburg (siege of), Wilderness, Williamsburg to White House, White House to Harrison's Landing, Yorktown to Williamsburg: country between Gettysburg and Appomattox, Monterey and Corinth, Shenandoah and Upper Potomac. Plans (16) of Confederate Fortifications Columbus, Ky., Defences of Charleston, Defences of Cincinnati, Covington and Newport. Rebel Line of Works at Blakely, Fort Fisher, Fort Fisher (vicinity of), Fort Donelson, Fort Henry, Forts Henry and Donelson (relative positions of) Mississippi River (Confed. fortifications on) Spanish Fort, Mobile Bay (siege operation), Fort Sumter (showing effect of bombardment at date recapture, 1865.) Williamsburg (Confed. Works at). Fort Delaware, Governor's Island (plan for a fort proposed to Gov. Jay). Marches (3) of Forces under Gen. Sherman 1863-65. Marches in Central Virginia 1864-65.

Frontier Military Departments (11): Map of U. S. showing Mil. Depts., and positions of Military Posts (1877). Dept. of Platte (Wyoming—Nebraska, 6), reconnaissance of routes in 1875, '76, '77, Dept. of Arizona, (revised 1875). Dept. of Missouri. States (2) of Kansas, Texas and Ind. Ter., (1874). Florida (1856). Territories (7) of Dakota (1872), Nebraska and Dakota &c., 1867. Southern and S. E. Nevada, (topog. of.) 1869. Arizona, (N. and S. E.,) Western Territories, New Mexico; Indian Territory. *Wheeler Exp. 1874* (23) Topog. Atlas Sheets—Surveys W. of 100th par.: Areas of drainage W. of Mississippi river; (parts of) E. Nev. and W. Utah, Central Col. S. Nev. and E. Cal., E. and S. E. Nev. and S. W. Utah, S. W. Col. S. Col. E. Col. S. Col. and N. New Mex., N. Cent. N. M., Cent. and W. Arizona, E. Ariz. and W. N. Mex. Cent. N. M., E. and S. E. Ariz. W. and S. W. N. M., (complete) Cent. and W. Utah, S. W. Utah, Cent. Col., S. W. Col., (San Juan Mining Regions), N. Cent. N. Mex. Reconnaissance in the Ute country (1873), New Route, Texas to Fort Yuma 1867, Road from Fort Dodge to Camp Supply, 1872. *The Mississippi etc.*, (19). Survey of 1878, Charts 1, 2, 3, 4, 5, 6, 7, 8, 9. Map of from Falls of St. Anthony to mouth of Illinois, from mouth of Illinois to Ohio (1878). Alluvial region of (1861). Map of Yellowstone and Missouri rivers and tributaries (1876), Yellowstone Lake and Valley of U. Y. river, the Yukon river (Alaska). Geographical Map of Black Hills (Ludlow), Carroll, Montana to Yellowstone. Reconnaissance of the Black Hills, Map of B. H. *Geological Expt. of 40th Par.* (1876). Geol. and Topog. Atlas acc. report of (King). 25 colored charts.

Miscellaneous (6) Maps of the U. S. (Engineers, 1877). Seat of War in Turkey (1877). Map of Afghanistan (1878). Map of Stage routes between N. Y and Balt., with operations British Army "from their landing at Elk river 1777 to their embarkation at Neversink 1778," (Phil. 1800). Map of Waterloo. Map of the Estado de Nuevo Leon, (1853).

List of Special, General, and G. C. M. Orders, Jan. 1, 1879, to April 1, 1880, as follows:—Hd. Qrs. Army; Divisions Atlantic, Missouri and Pacific; Departments Columbia, Dakota, East, Missouri, Platte, South and Texas.

List of General Orders, State Militia, as follows:—New York, for 1878, '79, '80 (72 orders and 4 circulars); New Jersey, Nos. 1-4, 1880, and Cir. 1, I. G. O., 1880; California, 8-12, 1880; Mass., 1-4, 1880. Illinois, 1, 1880; Penn., 1878, '79, '80.

MUSEUM.†

(Articles Loaned are marked thus *.)

ABBOT, Gen. H. L. Photographic Views of Torpedo Experiments at Willets Point, N. Y. H., 1878.

ANDRUSS, Capt. E. V. A. (1st Artillery.) Sword of Chinese Mandarin.*

ALLIEN, H. V., Esq. (New York.) One Old Pattern Prussian Helmet; 33 colored engravings representing Costumes of European Armies prior to 1850.

ASCH, Dr. M. S. (New York.) Photograph of Lieut.-Gen. Sheridan's horse, "Winchester," taken at New Orleans, 1865.*

ATKINSON, B. A., Esq. (Fort Wadsworth.) Portrait (oil) of Gen. Atkinson, U. S. A.

BARLOW, Col. J. W. Breech-loading wrought iron Cannon found in bed of Hudson, near Albany, N. Y. (Chinese.) Found loaded and spiked.

BARNES, Gen. J. K. (Surgeon General.) Eighty-six Photographs from U. S. A. Medical Museum.

BENET, Gen. S. V. (Chief of Ordnance.) 223 Field Guns and Small Arms,* as follows: ♦ (New York Arsenal 115.)

Field Guns, (20): 6 pdr. Bronze, U. S., 12 pdr. Mountain Howitzer, Br., U. S.; 6 pdr. James Rifled, br., U. S.; 6 pdr. S. B., br., "trunnion below axis," (French); 6 pdr. S. B., br., "trunnion below axis," (English); 3-in. Armstrong, rifled, iron; 42-in. Field Howitzer, br., (Rebel); 2-in. Breech-Loading, S. B., iron; 3½-in. B. L. Rifled iron, (Rebel); 3-in. Rifled, br., (Rebel). *B. L. Carbines*, (9): Ballard, 42; Burmese, 24; Colt's "Revol.", 44; Gibbs, 52; Greene 5, 6; Gallagher, "for paper C," 34; Galligher, "for met. C," 51; Hall's perc., 54; Joslyn, "for met. C," 33; Lindner's, 57; Merrill's, 54; Maynard, 50; Perry's, 52; Remington, 42; Smith's, 50; Scott & Triplett, 50; Spencer, 50; Spencer, Stablerith, 50; Sharp's, 50; Starr's, 54; Tarpley's, "rebel," 52; Unknown, (Rebel), 53; Ward Burton, 50; Wesson, 42. *M. L. Carbines*, (9): Aust., Rifled, 71; Eng. Cav., 577; Eng. Art., 577; Rebel Eng. Cav. ptn., 577;

* Articles loaned to this Collection will be carefully preserved and held subject to the owner's order.

† Notes.—Br., Bronze; S. B., Smooth-bore; B. L., Breech-loading; M. L., Muzzle-loading. The calibre is indicated by figures following name of maker.

Rebel, Richmond, Va., Musketoon, 58; U. S. Rifled Pistol, 58; U. S. S. B. Musketoon, 69; U. S. Rifled Musketoon, 69; B. L. Rifles, (6): Ballard, 44; Colt's Revol., 56; Sharp's, 52; Sharp's Sporting, 52; Spencer, 52; Hall's "flint," 54. M. L. Rifles, (5): Enfield, 577; Eng. Tower, 64-69; Jager, 54; Light French, 577; U. S. Flint-lock, 54. B. L. Muskets, (rifled), (2): Colt's Revolv., 56; Springfield Allins alt., 58. M. L. Muskets, (19): Aust., rifl., long, 69; Aust., rifl., short, 69; Dresden, rifl., short, 58; Enfield interchangeable, 577; Eng. Tower, S. B., perc., 72; French, rifl., back, act., 69; German Springfield, rifl., 58; Primer lock, rifl., 58; Primer-lock, rifl., (cadet), 58; Richmond, rifl., 58; Springfield, mod. 61, 58; Springfield, mod. 64, 58; Spanish, rifl., 58; Suhl, rifl., 58; U. S. rifl., mod. 22, 69; U. S. S. B., mod. 22, flint, 69; U. S. "Rifle Mod." S. B., 58. Revolvers, (Army), (13): Adam's, 44; Allen's 44; Colt's Metc. C., 44; Colt's paper C., new mod., 44; Colt's paper C., (Navy), new mod., 36; Joslyn's, 44; Lefaucheux, self-cocking, 4275; Perrin's, 44; Pellingill's, 44; Remington's, 44; Smith & Wesson, 44; Starr's, self-cocking, 44; Savage's, Army or Navy, 3625. Pistols, S. B., Single Bore, (2): Prussian, 60; U. S., "Flint," 54. Swords, (14): Musicians, U. S.; Mus., Foreign; Non-Com. Off., U. S.; Non-Com. Off., For.; Cav. For.; Cav. For., "iron-mtd." Foot Art., U. S.; Foot Art., For.; Foot Off., U. S. O. P.; Foot Off., For., O. P.; Staff Off., U. S. O. P.; Staff and Foot Off., U. S., patn., 72; Gen. Staff and Field Off., U. S., "O. P.;" Gen. Staff and Field Off., For. Sabres, (11): Light Cavalry, U. S.; Light Cav., Foreign; Heavy Cav., U. S.; Heavy Cav. For.; Heavy Cav. For., "iron-mtd." Horse Artillery, U. S.; Horse Art., For.; Cav. Off., U. S.; Cav. Off., For.; Art. Off., U. S.; Art. Off., For.

(From Springfield Armory,) 108 Small Arms, assorted patterns, received too late for insertion here in detail.

BIRD, Col. Chas. Field Glass and Revolver used in War 1861-5.*

BOWDITCH, Col. E. (Albany.) Collection of Australian Weapons and Implements.*

BRADEN, Lieut. C. (U. S. A.) Colors of 6th N. Y. Cavalry, carried through Campaigns A. of P., 1862-65; Collection of Arms (2 Swords, 1 Hunting Rifle, &c.); Indian Bows, Arrows, Leggins, &c.,--all formerly belonging to the late Gen. Thos. C. Devin, U. S. A.*

BRADLEY, Capt. C. O. (20th Infantry.) Part of Mexican Copper Shell, thrown at the siege of Fort Brown, Texas, 1846.

BROWN, Gen. N. W. Portrait of Gen. Jacob Brown, U. S. A.*

CUYLER, Gen. J. M. (Medical Department.) Cuirass and Helmet worn by Mexican Cavalry in Mexico during Scott's (1847) Campaign; * three Photographs representing the Arts and Sciences.

DUNN, L., Esq. (New York.) Copper Medal, commemorative of the Massacre of St. Bartholomew, from the die recently found in the Vatican at Rome.

ECKERSON, Major T. J. (Q. M. D.) Part of Musket Band Swivel, from the Battle-field of Buena Vista.

FARRAGUT, Capt. Loyall. *Bowie Knife** captured at Fort Morgan, Mobile Bay, 1861.

FOSTER, Mrs. D. H. (New York.) Washington Card Table*, one of a pair presented to Judge Berrien, of Rocky Hill, N. J., by his friend Gen. Washington, who afterwards (1782) often used them. Washington wrote his "Farewell Address to the Army" at Rocky Hill.

FRY, Gen. J. B. (Adj.-Gen. Dep.) Photograph of Washington, from the original cast in Mount Vernon, 1785; Stone Hatchet; Crystallized Stone; Carved Slate Figures.

GOODWIN, Rev. E. C. H. (Governor's Island.) Piece of Flagstaff, captured from the Plaza at the surrender of the City of Mexico, 1847, by Lieut. Laidley, U. S. A.; * Button, made from sea-shell, worn by Washington; * Curious Silver Knife, Fork, and Spoon, elaborately chased, bearing date 1492; * Land Grant, signed by Patrick Henry.*

GRAHAM, Gen. L. P. (U. S. A.) Photographs of original Officers of Co. "G.," 2d U. S. Dragoons, (organized 1836), taken in New York, January 7, 1879,—presented by request of Council, M. S. I.

HANCOCK, Gen. W. S. (U. S. A.) Boring for Diamond Reef, off Governor's Island, New York Harbor; Portrait of Gen. Hancock,—presented at request of the Council M. S. I.; Bone used by Indians for dressing buffalo hides.

HEYL, Capt. E. M. (4th Cavalry.) Pair Indian Shields and Tomahawk.*

JANEWAY, Col. J. H. (Medical Department.) Indian Cradle, captured during an affair with the Cheyennes by the late Lieut. Henely, 6th Cavalry, when a mother and child were killed accidentally, the ball passing through the cradle.*

JOCELYN, Capt. S. P. (21st Infantry.) Stone Implement (relic of Stone Age), from Prince of Wales Island; Pair of Alaska Indian Snow Shoes, Hudson Bay Pattern; Pair of Ladles, made from horns of the caribou by the Stickeen Indians, Alaska; Apache Indian Work Basket; Garnets from Fort Wrangel, Alaska.

JONES, Basset, Esq. (New York.) Etching,—Cavalry Column on the March, by Detaille.

JONES, W. R. Esq. (Lake Mohegan, N. Y.) Carved Powder Horn, bearing name of maker, Lake George, 1738.*

KELLOGG, Miner K. Esq. (New York.) Portrait of Gen. Scott (oil), taken in 1849; * Life size Portrait of Cavalier (oil),—supposed to be an Old Master,—found by its present owner in a Genoese Palace in 1845; * Putnam's Jack Knife, found at West Point in 1838.

LANGDON, Col. L. L. (2d Artillery.) Punch Bowl,* presented to Officers, 2d U. S. Cav. by Citizens of St. Louis, 1855; Regimental Standard, 18th Penn. Cav., captured by Wise's Brigade, C. S. A., 1863, and found in Capitol, Richmond, at the surrender, in 1865; * An Ordinance to repeal the U. S. Constitution, taken from War Office at Richmond, Va., in 1865; Tassel from canopy over Chair, Vice-President of the Confederacy; Piece of Martin Luther's Pulpit,* Twin bullets from Waterloo—one English, the other French,—supposed to have met in air and united during the battle; Canister Shot* from battle-field of Leipsic; Two bullets and screw-driver* from Lions Mound, Waterloo; "Calthrop" (Caltrop), from Liege—thrown to disable cavalry; Piece of skull of British soldier killed at Waterloo; Piece of brick from ruined Chapel in Courtyard of the Château Hougoumont, held by British at Waterloo; Horseshoe* of an Austrian Cavalry horse killed at battle of Hohenlinden; Piece of Flag* hoisted by Lieut. Slemmer, 1st U. S. Artillery, on his occupation of Fort Pickens, Fla., winter of 1860; Original sketch* (child's head) made by the artist Whistler when a cadet in 1852; Engraving of the battle of Waterloo.

LARNED, Prof. C. W. (U. S. M. A.) Specimens of Drawing by members of the 2d and 3d classes United States Military Academy at West Point, 1879, as follows:

1. Perspective Drawing, in water colors, of 10-inch Brass Mortar and Bed, model 1844, by Cadet H. A. Schroeder (2d class), U. S. M. A.
2. Orthographic Drawing, in water colors, of Steam Drill, by Cadet H. A. Schroeder, (3d class), U. S. M. A. 1879.
3. Orthographic Drawing, in water colors, of Hand Metal Drill, by Cadet S. E. Stewart (2d class), U. S. M. A. 1879.
4. Perspective Drawing, in water colors, of Ordnance Hand Truck, by Cadet C. H. Parke, (2d class), U. S. M. A. 1878.
5. Orthographic Drawing, in water colors, of Colt's Army Revolver, pattern 1876, by Cadet J. B. Batchelor, (3d class), U. S. M. A.
6. Geometrical Drawing of Ellipsoid of Revolution, with shade and shadow, on horizontal plane, by Cadet J. Millis, (3d class), U. S. M. A.
7. Geometrical Drawing of Upright Screw, with shade and shadow, by Cadet J. Millis, (3d class), U. S. M. A.
8. Perspective Drawing of Upright Cylindrical Ring, with shade and shadows, by Cadet J. Millis, (3d class), U. S. M. A.
9. Perspective Drawing of Groined Arch, with shades and shadows, by Cadet J. Millis, (3d class), U. S. M. A.
10. Front Elevation of Stone Chapel, by Cadet G. W. Goethals.
11. Topographical Study in colors, by Cadet Schroeder.
12. Screw Die and Bed, by Cadet Holton. 1879.

LEOSER, Col. C. McK. (New York.) Two *Autograph Letters*, President Santa Anna, Mexican Republic, to Col. A. G. Garcia, dated Aug. 26, 1843, Feb. 9, 1844; Table of Distances between places in U. S. and Mexico; Instrument under hand of José Justo Carro, President of Mexican Republic, April 14, 1846, permitting A. Garcia to retire from army, and appointing him to active militia with rank of Colonel of Cavalry.

LORING, W. G. (Captain, Steamer 'Atlantic.') Equipments worn by a 16th Mass. Light Artilleryman, in the War of the Rebellion.

MICHELL, Col. W. G. (A. D. C.) Battle Flag, 2d Army Corps,* Army of the Potomac, carried by the staff of Major-General Hancock during the battles of the Wilderness, May 5, 6, and 7, 1864; battle of the Po., May 10, 1864. It was last borne during the assault on the enemy's works at Spottsylvania Court House, May 12, 1864. Subsequently presented by Gen. Hancock to his senior A. D.-C., Brevet Brig.-Gen. W. G. Mitchell, U. S. V. (now U. S. A.)

NOYES, Maj. H. E. (4th Cav.) Map showing Battle Grounds of Chickahominy and subsequent engagements in Retreat of Federal Army towards James River, and other points in connection with Siege of Richmond; plan of Prison Buildings at Richmond; photo of Gen. Winder, taken at Macon, Ga.

OAKLEY, Capt. D. (New York.) Collection of Japanese, Soulou, and Malay Weapons, including swords, spears, campfans, creeses, and knives; many in elaborately lacquered or carved scabbards, and all arranged on gilt screens.* Trophy of Arms of War of 1861-65, including articles worn or captured from the enemy by the owner.* Collection of Indian Weapons and accoutrements, including Red Cloud's

- pipes, Indian cards, etc.* Pair of English Horse-Pistols, muzzle-loading, flint-lock, with curious spring bayonet attachment, London, 17—.*
- PARKER**, Col. J. B. Battle Flag,* 2d Army Corps, carried at Cold Harbor, Ream Station, and Hatcher Row, (1864.)
- RAMSAY**, Capt. J. G. (2d Artillery.) Model Canoe and Esquimaux (Alaska.)
- RODENBOUGH**, Gen. T. F. (U. S. A.) The War with Mexico, (being a series of seven fine chromo lithographic views of the principal battles, after sketches taken on the spot.) The Fight for the Standard (Leonardo da Vinci), engraved by Edelinck, 1860.* Confederate Notes. Bust of Gen. Grant.
- RUSSELL**, Lieut. E. K. (1st Artillery.) Water color drawing of Fort Delaware and Pea Patch Island, Del. River; Camp Bed of Mexican General La Vega, who was captured by May's squadron, 2d U. S. Dragoons at Resaca de la Palma, May 9, 1866.
- SANGER**, Major J. P. (1st Artillery.) The Pekin Gazette, the only newspaper in the Chinese language printed in China in 1876. Visiting Cards of the leading officials of Chinese Government.
- SHERIDAN**, Lieut.-Gen. P. H. (U. S. A.) "Winchester," the charger (stuffed) of Gen. Sheridan, which carried him in action during the greater part of the late war; also, pedigree and military history of the horse, duly authenticated and signed by the Lt.-Gen.
- SIMPSON**, Gen. M. D. L. (Sub. Dept.) Portrait* of Gen. Geo. Gibson, Commissary General, U. S. A., 1818-60, with Autograph Endorsement by the late Gen. A. B. Eaton.
- SMITH**, Lieut. O. M. (22d Infantry.) One Indian riding whip; one pouch of porcupine quills; one buffalo tooth.
- SMITH**, Gen. W. F. (New York.) Relics of Revolutionary War, found by Capt. Steers, Police Dept., New York, in excavating near 157th Street, August 1878, comprising camp utensils, sword hilt, leaden bullet, buttons, English copper coin, snaffle riding bit, etc.
- SNYDER**, Capt. J. A. (3d Inf.) Preserved Specimens of large game:—one Elk's head, one Deer's head, and one Mountain Sheep's head.
- STURGIS**, Gen. S. D. (7th Cavalry.) Photograph of "Comanche," the only living creature found on the Custer battlefield (Little Big-Horn); he was found with seven bullet wounds, lying by the side of his dead master, Col Keogh. "Comanche" is now well, and has been adopted by his old regiment (7th Cavalry) as the regimental charger, and, by order, forever exempted from all labor.
- SWEENEY**, Capt. H. (4th Cavalry.) Thigh Bone of Mastodon found recently in Indian Territory by detachment of 4th U. S. Cavalry.
- TARR**, H. G. H., Esq. (New York.) Map of Stage Routes between New York, Baltimore, &c., with operations of British Army from 1777 to 1778.
- WARD**, Lieut. G. S. L. (A. D. C.) Indian Collection,* comprising Bows, Arrows, Whips, &c.
- WARD**, Capt. T. (1st Artillery.) War Guidon of Battery "D," U. S. Artillery, bearing date 1862, 1863, 1864.*
- WINGATE**, Gen. G. W. (New York.) Namaqua Bucket and Belts, used by the 1st Hants Mounted Rifles (English) for carrying the carbine when attached to the saddle.
- WOOTEN**, Capt. Cavalry Revolving Pistol,* with holster (London), captured from the enemy at——, by——.
- WORTH**, Miss M. (Governor's Island.) Seven Oil Paintings,* viz:—Battle of Molino del Rey (Mexico), 1847 (Col Tracy); Battle of Churubusco, 1847 (Tracy); Portrait of Gen. Worth (Tracy); Views (2) at West Point (Eastman); also a Portrait of Gen. Worth (Brady), and Engraving, "Wounded Soldier" (Vernet); Gen. Worth's Field-glass; * Chessmen made from flagstaff City of Mexico.*

ADDITIONAL.

(Received too late for Classification.)

ALEXANDER, Gen. W. L. (Ad'jt Gen., Iowa.) Report for 1879. (1 vol.)**BEAUREGARD**, Gen. P. G. T. (Ad'jt Gen., Louisiana.) Reports 1877, '78, '79. (3 pamphlets.)

- BERRY, Gen. A. H. (Ad'jt Gen., Mass.) Reports, 1869, '72, '74, '76, '78; Mil. Laws, 1876, '78. (8 vols.)
- HILLIARD, Gen. H. (Ad'jt Gen., Illinois.) Reports, 1873, '74, '75, '76, '78. Mil. Code and Gen. Reg., S. I., 1879. (6 vols.)
- LATTA, Gen. J. W. (Ad'jt Gen. Penn.) Penn. Soldiers Orphan Schools; Mil. Code, S. P., 1874; A. G. Reports, 1862, '63, '64, '67, '69, '70, '72, '74, '75, '76, '77, '78, '79. (15 vols.)
- NUCKOLS, Gen. J. P. (Ad'jt Gen., Kentucky.) Reports for 1879. (1 vol.)
- STEVENS, Col. E. G. Regulations M. V. M., 1876; Mil. Laws, Mass., 1874, '75, '76, '78; Ad'jt Gens. Report, 1875, '76, '77, '78. (7 vols.)
- RYDER, Col. S. Oscar (N. G. S. N. Y.) 1 Gold mounted Remington Rifle,* won at the Fair of the 7th Reg't, N. G. S. N. Y.

[E]
CORRESPONDENCE.

I.

THE PRESIDENT OF THE UNITED STATES.

EXECUTIVE MANSION, WASHINGTON, November 9, 1878.

MY DEAR SIR,—I have to thank you for your note informing me of my election as an Honorary Member of "The Military Service Institution of the United States," and to assure you of my appreciation of the honor. I infer from a perusal of the paper enclosed by you that the honor is *ex-officio* only.

Sincerely,

R. B. HAYES.

COLONEL T. F. RODENBOUGH, Corresponding Secretary, etc.

II.

AUTHORITY FOR TRANSPORTATION.

WAR DEPARTMENT, WASHINGTON CITY, January 24, 1879.

^{307.} SIR,—Referring to your letter of the 4th instant transmitting a copy of the Resolution of the Council of the Military Service Institution, requesting that the Quartermaster's Department be authorized to transport articles contributed by officers of the Army to the Library or Museum of the Institution, I beg to inform you that the authority has been granted as requested.

Very respectfully,

Your obedient servant,

GEO. W. McCRARY,

Secretary of War.

To GENERAL W. S. HANCOCK, President, Military Service Institution, U. S., Governor's Island, N. Y.

WAR DEPARTMENT, QUARTERMASTER-GENERAL'S OFFICE,
WASHINGTON, D. C., January 28, 1879.

LIEUT.-COL. ALEX. J. PERRY, C. Q. M. Mil. Div. Atlantic and Department of the East, Governor's Island, N. Y. H.:

COLONEL,—The Honorable the Secretary of War has granted, at the request of the Military Service Institution of the United States, that the Quartermaster's Department be authorized to transport articles contributed

by officers of the Army to the Library or Museum of the Institution. You will be governed accordingly.

Very respectfully, your obdt. servt.,

M. C. MEIGS,

Quartermaster-General,

53-1879.

Bt. Maj.-Gen. U. S. A.

NOTE.—Officers of the Army, or others, desiring to contribute to the Library or Museum, either by gift or by loan, can secure free transportation at the office of the nearest Quartermaster U. S. A. In case the foregoing instructions have not been received at such office, an official copy of the Quartermaster-General's letter will be furnished, on application to the "Corresponding Secretary, M. S. I., Governor's Island, N. Y. H.", to whom all contributions (properly packed) should be consigned.

III.

AUTHORITY TO OCCUPY QUARTERS.

THE MILITARY SERVICE INSTITUTION OF THE UNITED STATES,
OFFICE OF THE PRESIDENT,
GOVERNOR'S ISLAND, N. Y. H., January 4, 1879.

To the HONORABLE SECRETARY OF WAR, Washington, D. C.:

SIR,—I have the honor to transmit herewith copy of a Resolution¹ of the Council of the Military Service Institution of the U. S., the subject of which I would recommend to your favorable consideration.

I am, Sir,

Very respectfully

Your obedient servant,

WINFD. S. HANCOCK.

[ENDORSEMENT.]

WAR DEPARTMENT, January 24, 1879.

General Hancock may provide rooms at Governor's Island, as requested, provided it does not interfere with any of the needs of the garrison.

By order of the Secretary of War,

H. S. CROSBY,

Chief Clerk.

¹ RESOLVED, That the Honorable Secretary of War be requested to authorize the assignment, for the purposes of the Military Service Institution of the U. S., of such rooms at Governor's Island, N. Y. H., not required for the public service, as in the discretion of the Commanding General of the Division of the Atlantic may be available.

IV.

ROYAL UNITED SERVICE INSTITUTION.

WHITEHALL YARD, LONDON, S. W., 20th March, 1880.

SIR,—With reference to a letter which the Council have received from Captain Arthur, R. N., Naval Attaché at Washington, mentioning that the Military Service Institution of the United States would be glad that an interchange of Journals should take place, I have been directed to inform you that the Council have much pleasure in sanctioning the proposed interchange, and the number of the Journal to be published in April, and commencing a new volume, will be forwarded in due course.

* * * * *

I remain, Sir,

Very faithfully yours,

BAUGHEY BURGESS, Captain,

Secretary.

To BT. BRIG.-GEN. T. F. RODENBOUGH, Corresponding Secretary,
Military Service Institution, Governor's Island.

V.

UNITED STATES NAVAL LYCEUM.

NAVY YARD, NEW YORK, February 2, 1880.

SIR,—At a regular meeting of the U. S. Naval Lyceum, held on January 31, 1880, it was resolved to call attention of the officers of the Military Institute at Governor's Island to chapter vi. sec. 8, page 9, of the By-Laws of the U. S. Naval Lyceum, which reads:

"Sec. 8. The Officers of the Army of the United States shall be tendered the use of the rooms of the Lyceum, with the privilege of access to its Library, Cabinet, etc."

I also herewith enclose you a receipt for Vol. I., No. 1—Journal of the Military Service Institution; also a copy of the By-Laws and a copy of the Catalogue of the Library and Museum. A new Catalogue of the Library is now being prepared, and will be sent you as soon as finished.

Very respectfully,

Your obedient servant,

C. H. LYETH,

Master, U. S. N.,

Secretary.

THE SECRETARY OF THE MILITARY SERVICE INSTITUTION.

VI.

NATIONAL RIFLE ASSOCIATION OF AMERICA.

NEW YORK, April 8th, 1880.

SIR:

At a meeting of the Board of Directors of this Association, held on Tuesday, 6th inst., upon representation that your Institution would be glad to receive the American Centennial Trophy "Palma," for exhibition, the necessary authority was given our Prize Committee to make the transfer from its present place of storage to your Museum.

I am, Sir,

Yours very respectfully,

FRANK K. DONALDSONS,

Secretary N. R. A.

BVT. BRIG.-GEN. THEO. F. RODENBOUGH, U. S. A., Cor. Sec'y Military Service Institution.

[F]

RESOLUTIONS OF THE EXECUTIVE COUNCIL.

CIRCULAR TO HEADS OF DEPARTMENTS AND CHIEFS OF BUREAUX, U. S. MINISTERS, AND CONSULS.

RESOLUTION No. 8.

Adopted March 8, 1879.

Resolved,—That a Circular Letter, transmitting a copy of the first number of the Journal of Transactions of the Military Service Institution of the United States, be addressed by the President to each head of a department or chief of a military bureau at Washington, and also (through the Department of State) to each minister and consul of the United States abroad, inviting them to procure for the Library and Museum of the Institution such government publications or other articles as may, without especial inconvenience, be readily obtained.

FORMATION OF MILITARY PORTRAIT GALLERY.

RESOLUTION No. 9.

Adopted March 25, 1879.

Resolved, That with a view of forming a gallery of portraits of distinguished officers, who may have at any time held commissions in the armies of the United States, an invitation be and it is hereby extended to those now living, and to the friends of those deceased, to contribute a portrait of any one above specified, either in oil, crayon, or photograph, for preservation in the Library of the Military Service Institution ; and the Corresponding Secretary is requested to transmit a copy of this resolution to all concerned.

CONCERNING THE LIBRARY AND MUSEUM.

RESOLUTION No. 18.

Adopted March 25, 1879.

Resolved,—That each member of the Council be urged to call the attention of the officers of his regiment or corps to the wants of the Institution, inviting each to contribute at least one book or other suitable article to its collection.

And further, *Resolved*, That each representative of a staff corps and department in the Council shall endeavor to procure, as soon as practicable, complete sets of official publications, public documents, maps and plans, specimens of small arms, ammunition, or other ordnance and ordnance stores, or ancient and modern articles illustrating the equipment of soldiers, and any other desirable or curious thing which the chiefs of those corps or departments may be willing to give or loan to the Museum or Library of the Military Service Institution of the United States.

HISTORICAL COLLECTION.

RESOLUTION No. 20.

Referred June 2, 1879.

Resolved,—That it is the duty of the Military Service Institution to collect everything bearing upon the history of the army of the United States—either printed or MS. matter—with a view to the ultimate compilation and publication of a complete and reliable account of the organization and operations of the army ; therefore, *Resolved*, That a committee of three be appointed to prepare and submit a plan for the execution of said purpose.

The resolution was referred to a committee which reported (September 26th) as follows :

" That it is recommended that a committee of three members of Council to be known as the ' Historical Committee,' be appointed by the president of the Institution ; that it shall be made the duty of this committee to invite contributions of printed matter, original MS., or duly authenticated copies thereof, relating to the Military History of the United States, from the earliest settlement of the country, and especially concerning the history of the regular army since its establishment, with a view to the ultimate arrangement and publication of said material under the auspices of the Military Service Institution. All such material to be deposited with the Recording Secretary, who may, with the approval of the Historical Committee, select MS. deemed worthy of early publication and submit the same to the Publication Committee for its action ; if not used by that committee to be promptly placed on file."

NEW BOOKS..

A Treatise on Military Law. By LIEUTENANT ROLLIN A. IVES, 5th Artillery. D. Van Nostrand. N. Y., 1879.

To the student of military law the older works on that subject are never out of date, because none of the later ones profess to give an exhaustive historical presentation of its various principles. To discover these we must go far back of our own brief history. It is for this reason that no new work carried out on Lieutenant Ives's plan can completely drive from the field those which have gone before; and, evidently, this was not his intention. No doubt all that is claimed for the work is that it is a convenient manual of the military law of to-day.

Our works on military law are very few in number. For many years before the appearance of Lieutenant Ives's book the standard American authority was that of General Benét, and it is from him that a very large number of officers now in service have either directly, or indirectly, obtained their knowledge of military law. General Benét's work served its purpose for many years, and did it well; but the progress of military law has left it behind. Since it was written many new and important questions have arisen, and have been decided by the highest authorities of the land; principles before unsettled have been fixed; and there has been a noticeable increase of interest in the law which governs the army—partly due to the prominent character of some of the recent military trials. This rendered a new work on military law almost a necessity, and Lieutenant Ives has supplied the want. This book may be said to bring the subject of military law down to date.

In this connection, however, we notice that (on page 106) Lieutenant Ives quotes approvingly from the case of *McCall v. McDowell*. This case illustrates an extreme view as to the obligation of orders; and, in the extent to which it goes, stands alone. There always has been a difference of opinion as to how far the inferior is constituted a judge of the lawfulness of his superior's orders; but the case here cited would be a dangerous one to follow.

Lieutenant Ives has arranged his book so that it is equally well fitted for a text-book, and a book of reference.

The fact that it is used as a text-book at the U. S. Military Academy is a sufficient indication of the estimation in which it is held.

The present seems to be a period of revival of study in the army. New literary enterprises of a military character are constantly undertaken. It is gratifying to see that this important branch—the law military—has not been neglected.

REVISED CODE OF BY-LAWS.

TITLE.

This Society shall be known as THE MILITARY SERVICE INSTITUTION OF THE UNITED STATES.

LOCATION.

The Rooms or Headquarters shall be in the city of New York.

DESIGN.

The Design contemplates professional unity and improvement by correspondence, discussion, and the reading and publication of essays; the establishment of a Military Library and Museum; and, generally, the promotion of the military interests of the United States.

COMPOSITION.

All Officers of the Army and Professors at the Military Academy shall be entitled to membership, without ballot, upon payment of the entrance fee.

GOVERNMENT.

1st. The Officers of the Institution shall be a President, five Vice-Presidents—(two Staff and three Line officers), a Treasurer, a Vice-Treasurer, a Secretary and an Assistant Secretary.

2nd. There shall be an Executive Council, consisting of the officers aforesaid *ex officio*, and one representative from each Staff Corps and Department not represented by a Vice-President; two representatives each from the Cavalry, Artillery, and Infantry arms, and one representative from the Retired List; *Provided*, that these proportions may be disregarded if in any case there should not be officers from all such branches of the service available.

3d. The affairs of the Institution shall be conducted by the Executive Council, which may make such regulations, not inconsistent with these By-Laws, as may seem necessary. Five members of the Council shall constitute a quorum.

The Executive Council, by a majority vote of the meeting, may fill, *for the unexpired terms*, all vacancies which occur among its members.

4th. Five members of the Council, to be appointed by the Chairman, shall constitute a Committee on Publication and Essays. It shall be the duty of that Committee to examine all papers submitted to it by the Council, and report the disposition which, in its judgment, should be made of them, and to recommend to the Council, for publication, the essays which the Committee may deem most suitable for that purpose.

The preparation of manuscript for publication, as well as the transaction of all business connected with printing and publishing, and the editing of the *Journal*, shall be done under the direction and supervision of the Committee on Publication and Essays, subject to the control of the Council.

Three members of the Committee shall constitute a quorum.

5th. The Council may appoint Corresponding Members of Council and shall prescribe their duties.

MEETINGS.

A General Meeting shall be held on the second Wednesday in January, annually, at which the regular report of the Executive Council shall be presented.

The Council may call a General Meeting at ten days' notice, by informing members individually, as far as practicable, and by such public notice as the Council may direct.

SUBSCRIPTIONS.

An entrance fee of five dollars (\$5) shall be paid by each member on joining the Institution; which sum shall be in lieu of the dues for the first year of membership.

The annual subscriptions shall be not less than two dollars (\$2), due January 1st.
The payment of a sum of not less than twenty-five dollars (\$25) shall constitute membership for life.

ELECTIONS.

The officers of the Institution shall be elected biennially at the General Meeting on the second Wednesday in January. The term of service shall be two years.

HONORARY MEMBERS.

The President and ex-Presidents of the United States, the Secretary of War, and the General and Lieutenant-General of the Army, shall be Honorary members of the Institution; *provided*, that the two officers last named shall be eligible for full membership.

JOURNAL.

A Journal of the Transactions of the Institution shall be kept by the Secretary, and as often as it may be deemed advisable by the Council, the Journal shall be published and distributed to members, free of expense.

Surplus copies may be sold under the regulations of the Council.

CHANGES IN THE BY-LAWS.

Changes may be made in these By-Laws, at any General Meeting, by an affirmative vote of two-thirds of the members of the Institution voting; *provided*, that due notice of said meeting shall have been mailed to each member and posted in the rooms of the Institution, at least sixty (60) days prior to said meeting; and *provided*, further, that absent members may vote by proxy.

[NOTICE TO MEMBERS.—*Each member of this Institution is requested to transmit, at his earliest convenience, to the Corresponding Secretary, his vote on the above proposed revision of the Code.*]

I

THE

Remington Breech-Loading Military Rifle.



**OVER 1,000,000 STAND SOLD TO EUROPEAN, ASIATIC AND
SOUTH AMERICAN POWERS.**

This well-known military and naval small arm, of which, it is believed, a larger number has been issued to troops in the field than of any other breech-loader, is now manufactured of all the calibres adopted by different nations, including the French, Spanish and Egyptian 43 cal., the English and Turkish 45, and the American calibres of 50 and 45. The conspicuous merits of its breech-loading system are its mechanical strength and simplicity and the consequent durability of the action; its positive power of shell-extraction and easy and natural manipulation, ensuring a rapidity of fire equal in experienced hands to that of improved repeating arms. As a long-range weapon this rifle has an established reputation for attaining the best result in the hands of marksmen or troops.

The Remington Rifle has been tested in nearly every part of the world, in actual field service, and has demonstrated its perfect efficiency under the severest campaigning trials and all conditions of climate. Its experiences during the Franco-Prussian war, in the hands of Egyptian contingents in the late Russo-Turkish war and in the Abyssinian campaign, in the Argentine revolutions, the Spanish wars in the Peninsula and in Cuba, the decisive battles of the U. S. Navy in Corea, and the present struggle between Peru and Chili, unequivocably assert the reliability of this arm.

Large numbers of Remington Rifles of the various calibres are kept in stock and can be promptly shipped. The capacity of the Armory at Ilion is equal to the production of 1,000 stand per day.

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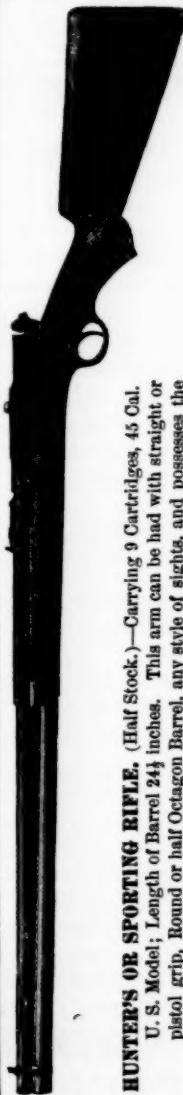
THE REMINGTON MAGAZINE RIFLE—Keene's Patent.



ARMY RIFLE.—Carrying 10 Cartridges, 45 Cal. U. S. Model. 9 in Magazine and 1 in the Chamber. Length of Barrel $3\frac{1}{4}$ inches. Weight without Bayonet, 9 lbs.



FRONTIER RIFLE.—Carrying 8 Cartridges, 45 Cal. U. S. Model. Plain Walnut Stock, Military Finish; Length of Barrel 24 inches.



HUNTER'S OR SPORTING RIFLE. (Half Stock.)—Carrying 9 Cartridges, 45 Cal. U. S. Model; Length of Barrel $24\frac{1}{2}$ inches. This arm can be had with straight or pistol grip, Round or half Octagon Barrel, any style of sights, and possesses the same finish as the well-known Sporting Rifles made by this Company.

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PEABODY-MARTINI RIFLE.

THE FOREMOST MILITARY WEAPON OF THE DAY.

The breech mechanism is very solid, and capable of standing the rough usage of a campaign. The ignition of the cartridge is always sure, and a positive motion extractor never fails to throw out the empty shells after firing.

During the execution by the Providence Tool Company of its large contracts with the Turkish Government (600,000 Peabody-Martini Rifles) 3,500,000 cartridges have been fired by the U. S. Inspectors without accident, and with an unfailing ejection of the empty shells. 200,000 cartridges have been fired from a single breech mechanism without injury to it, the barrel being replaced by a new one as soon as the chamber showed an enlargement of $\frac{1}{1000}$ inch, which was after about 30,000 shots. The Turkish model cartridge contains 85 grains powder, and the weight of the bullet is 480 grains.

The record of the PEABODY-MARTINI RIFLE for accuracy and long-range has been abundantly established.

Russian Officers of high rank, engaged in the recent Turkish War, give the strongest testimony to the wonderful efficiency of the Peabody-Martini Rifles with which their opponents were armed.

General TODLEBEN states : "The number of Turkish bullets which fell among the Russian ranks, when they were still 2,000 yards away from the defenders position, was such, that divisions which, at the outset, numbered from 10,000 to 12,000 men, were speedily reduced to a strength of from 4,000 to 5,000 ; in other words, they lost half their effectives."

The London *Times* of January 29th, 1880, says : "The rifles carried by the Turkish Infantry were the best in existence." Also, "The Infantry rifles of the Turks were the best known."

On page 329 of the published report of the U. S. Chief of Ordnance for 1879, Captain E. M. WRIGHT, of the Frankford Arsenal says : "We all know that the Turkish army was supplied with excellent arms and ammunition." General WHISTLER, of the U. S. Army, speaking of a comparative test he had personally witnessed, says : "This rifle I consider the best possible one which could be adopted for the soldier, on account of its accuracy, penetration, and wonderfully long range."

A Large Stock of Rifles always on hand ready for Delivery.

The Capacity of the Work is 800 Finished Rifles per Day.

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